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COMMENTARIES
UPON
BOERHAAVE's
APHORISMS
CONCERNING

The KNOWLEDGE and CURE of DISEASES.

BY

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&c. &c. &c.

Translated from the LATIN.

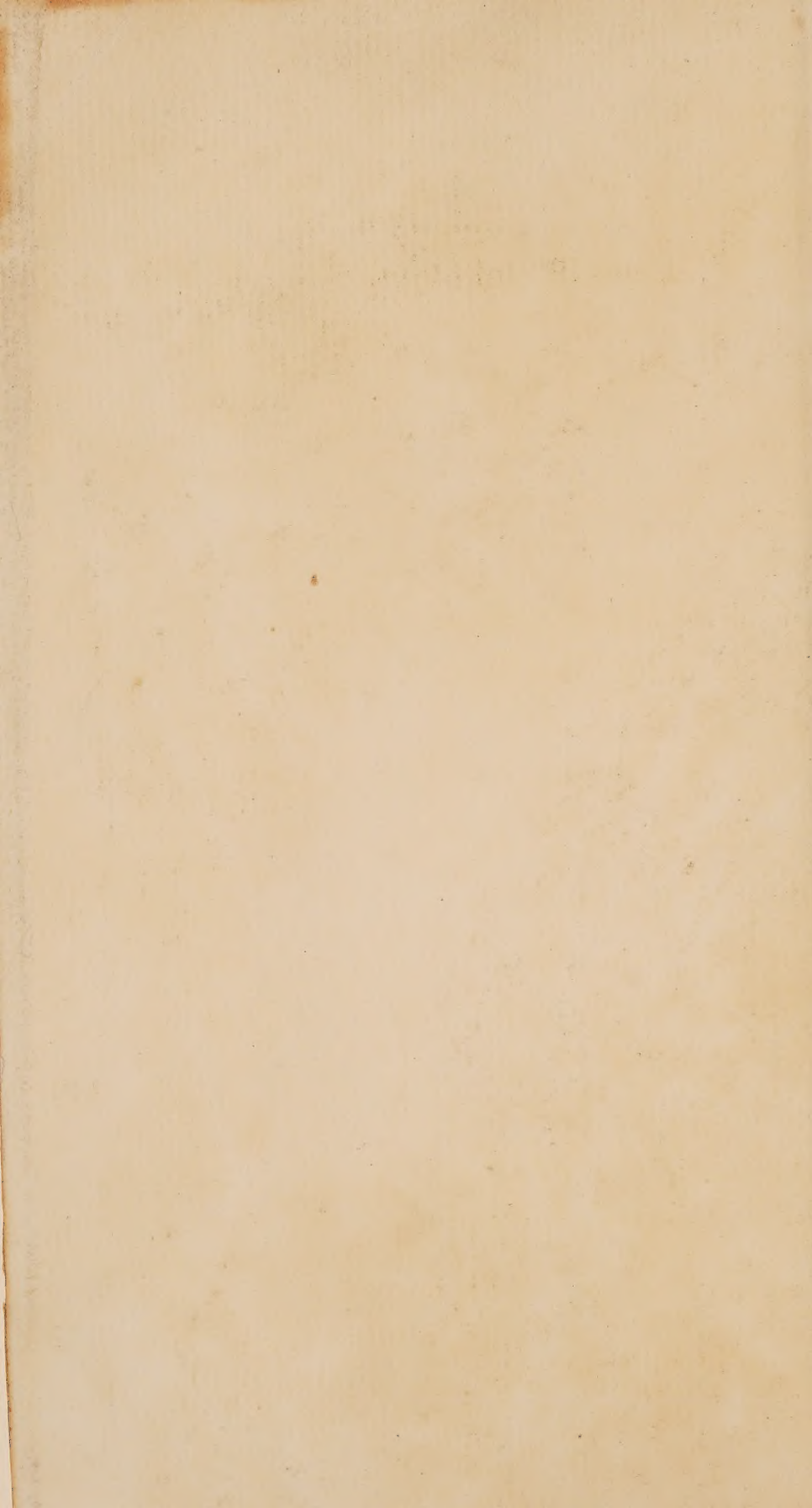
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THE
C O N T E N T S
OF THE
TENTH VOLUME.

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THE
C O N T E N T S
OF THE
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COMMENTARIES
UPON
BOERHAAVE's
APHORISMS
CONCERNING THE
KNOWLEDGE and CURE of DISEASES.

Of a NEPHRITIS, or INFLAMMATION
of the KIDNEYS.

§. 993. **T**HAT the kidneys themselves are invaded with a true inflammation, we know, From a pain that is great, ardent, inflammatory, and pungent or shooting, in those parts where the kidneys are seated; from the acute continual fever that accompanies the said pain; and from the little urine that is made, often discharged, but a little at a time, and of an intense red or flame-colour, or else, in the highest fit of the malady, of a watery appearance: to these add, A numbness in the thigh of the affected side, a pain in the groin and testicle that are next adjacent, the iliac passion, bilious vomitings, continual hickups.

The kidneys are by the Greeks termed *nephroi*, to which the termination *itis* is here added, according to a custom of the ancient physicians (see §. 771), who used it to denote inflammatory distempers in divers parts

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parts of the body, as plainly appears from Galen's definitions. For his words are: *A nephritis is an inflammation of the kidneys, with a violent pain*^a. He indeed adds, *Sometimes to this is joined a difficulty of making water, which often contains fibrous or membranous excretions, sandy or gravelly matters, or a small quantity of blood*^b. From this last sentence, there have been some who include other different diseases under the present denomination; as at this day we see it is common to call those patients *nephritic* who are troubled with the gravel or stone, even without any inflammation of the kidneys. But in the mean time it is evident enough, from the definition here given us by Galen, that by the term *nephritis*, in its proper sense, we are only to understand an inflammation of the kidneys; to which, as he informs us, the other symptoms are only *sometimes* added. Accordingly Hippocrates^c, as he includes almost all (but more especially the chronic) diseases of the kidneys under one denomination, does not use the word *nephritis*, but calls them *renal* (τα νεφριτικά.)

Now the present known fabric of the kidneys, with what we before propounded in the history of Inflammation, make it plain enough, that those organs may be invaded with such a phlegmon or inflammation; and that the inflammatory symptoms here attending (see §. 382.) must be considerably violent or severe, both from the great vicinity of the heart, and from the largeness of the emulgent arteries which enter into the kidneys, and are immediately subdivided into the smallest branches; from whence the impetus of the blood, urging upon the least vessels obstructed, will be very violent.

The diagnostic signs, therefore, which point out that this malady is present, are first derived (as in our text) “from a pain that is great, ardent, inflammatory, and pungent or shooting in those parts where

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^a Nephritis est renum inflammatio, cum vehementi dolore. No 282 Charter. Tom. II. p. 264.

^b Interdum ei adjuncta est meiendi difficultas, cum fibrosis excretionibus, aut arenosis, aut modico sanguine. Ibid.

^c Aphor. 6. sect. vi. Charter. Tom. IX. p. 251.

“ the kidneys are seated.” But the region in which the kidneys take up their residence is easily found ; since they are placed upon the loins, at the distance of about three fingers breadth from the spine or bony column of the vertebræ, extended so that the upper margin of the kidney usually touches the third rib counting upwards. Therefore the pain felt from an inflammation of the kidneys lies chiefly in the lateral and back parts of the abdomen, which lie betwixt the *os ilium* and the lowermost ribs. But an acute continual fever also attends here, as it commonly does in other inflammations, but more especially those of the internal viscera ; like what we proved before at §. 382, n^o 8.

From the little urine made, &c.] Since the kidneys are appointed to separate the urine from the arterial blood brought to them by the ample emulgent, this function of them must unavoidably be injured by their inflammation. For the turgescence of their inflamed vessels will compress their smaller secretory tubes, and will consequently lessen the quantity of the liquor to be this way separated : but as the urine is at the same time rendered more acrid by the acute fever which attends, the patient will therefore oftener perceive a stimulus or uneasiness for the discharge of it, even though but little urine be contained in the bladder. But when all the renal tubes or vessels are become so far compressed or stuffed up that they can only transmit the most liquid parts of the humours, the urine is then discharged thin and watery ; altho’ the blood continues to be agitated with a violent fever, and thereby has its salts and oils rendered more acrimonious, (see §. 100.) But then such a urine is justly condemned for bad, both as a sign and as a cause. As a sign, because it denotes a very violent degree of the inflammation, and that throughout the whole substance of the kidney : and as a cause, in as much as all the acrid or vitious parts of the humours are now retained, that by the laws of nature ought to be this way evacuated from the body ; and instead of which, the fine diluent vehicle of the blood, driven through the kidneys,

neys, being thus exhausted from the other parts, increases the inflammatory density of the blood.

A numbness in the thigh of the affected side, &c.] Since the kidneys are not properly lodged within the capacity of the abdomen, but are only covered by the peritonæum that is incumbent upon them, we may easily perceive that by an inflammatory distension of them many of the parts adjacent may be compressed and irritated; but since the peritonæum that is expanded over the kidneys generally hinders them from pressing much by their over-distension upon the viscera of the abdomen, for the same reason that pressure is more returned upon such other parts adjacent to the kidneys as are with them placed behind the peritonæum, excluded from the capacity of the abdomen. Now here are placed the psoas muscles ^d, with the great blood-vessels, and many nerves descending into the thigh, while the spermatic vessels also run along very near to the kidneys ^e; from whence we may in some measure understand why the symptoms here enumerated can be produced from an inflammation of the kidneys. Again, we know by most certain observations in practice, that sometimes morbid symptoms shew themselves in certain parts of the body, while their cause is seated in some part very remote; as we proved by several instances (at §. 701.) where we treated upon a Febrile Delirium. It will therefore be of use for the physician to be acquainted with the diagnostic signs of the present malady, although he understands not well the manner how they are produced. However, it deserves to be remarked, that these symptoms more frequently accompany a nephritis that comes from a stone or gravel, than one that is merely inflammatory; for this last I have sometimes had under cure when the patient has made no complaint of any numbness in the thigh, nor any pain in the groin or the testicle. Moreover, in a gravelly nephritis, when a calculus is protruded through the ureter, these same symptoms are not always present, although they frequently attend. Piso, who was afflicted with this distemper, affirms,

that

^d Vide tabulam xix. Eustachii.

^e Vide tabulam xxv. Eustachii.

that he had a revulsion or drawing up of the testicle of the affected side; a strangury, or at least an itching in the glans; a frequent making of water; a sort of stupor or trembling felt in the correspondent thigh; and, finally, a coldness of the extremities. But then to these signs reckoned up, he afterwards subjoins: *Which symptoms indeed, although they attend not constantly in every case of the malady, were yet always experienced in myself, but at the time when the stone made its descent through the ureter, namely when the contraction of the ureters in themselves is very great*^f. If we consider the course of the ureters with respect to the iliac and spermatic vessels as they are in the tables of Eustachius^g, it will easily appear, that a calculus in descending through the ureter must compress and irritate those vessels, together with the vas deferens, which ascends from the testicle to the seminal vesicles.

Iliac passion, &c.] More especially when the disease is very violent; for then all the nerves dispersed thro' the abdominal viscera being irritated, produce the terrible symptoms of this malady, as we shall presently shew at §. 995. This is the reason why Galen tells us, as we before observed at §. 963. that iliac and colic pains are difficultly distinguished from nephritic complaints; but that this is of no very bad consequence, because those distempers in their beginning require the same treatment; as will appear hereafter, when we come to the Cure of a Nephritis. The same difficulty of distinguishing is also acknowledged by Ægineta^h, especially when the malady arises from a small stone of the kidney moved into the narrower parts of the pelvis and ureter; for at such times suddenly follow the most violent irritations of all the abdominal nerves. But in a nephritis merely inflammatory, the beginning of the malady is seldom attended with the symptoms of the iliac passion, which however

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accom-

^f Quæ sane symptomata, tamen si non perpetua in omnibus, tamen semper in me sum expertus, sed in descensu per ureterem lapilli, quo tempore scilicet maxima est ureterum in se contractio. *De Morbis a Pro-luvie Serosa, sect. iv. cap. vii. p. 301.*

^g Tab. xii. fig. 1. et 3. et Tab. xxv. ^h Lib. iii. cap. 45. p. 46. et 47. versa.

accompany the disease when it is farther advanced: and therefore a burning inflammatory pain in the parts where the kidneys are seated, together with a difficulty of making water, will afford the signs by which this disorder may be distinguished from colic and iliac pains: to which add, that, in a nephritis, the bowels are seldom so much bound up, but that they become easily obedient to emollient clysters.

But the diagnostic signs of a nephritis are very well collected together by Celsus: *But if the parts about the hips and the os sacrum, and the loins betwixt them and above the pubes, are invaded with a pain, accompanied with frequent belchings, and sometimes with bilious vomitings, a coldness of the extremities, a frequent desire for making water, but with great difficulty, and when it is once discharged appearing like water, or else reddish or pallid, giving little or no relief to the malady, while the stools are voided with much difficulty or straining; the disorder lies then altogether in the kidneys* ⁱ.

§. 994. **A**LL the general causes therefore of inflammation, applied to the kidneys, produce this malady (§. 993.): and consequently, 1. All such as hinder the free transmission of the humours through the final extremities of the arteries; such as, Wounds, contusions, abscesses, tumour, long lying on the back, violent straining of the body, a little stone, &c. 2. Whatever hinders the urine from passing thence into the pelvis, ureter, and bladder; such as, The causes before mentioned, and those which follow, applied to these parts. 3. Whatever forcibly drives the grosser blood into the uriniferous ducts or tubes; such as, Violent running or horse-riding

ⁱ Si dolent coxæ, quæque inter has superque pubem sunt; et accedunt frequentes ructus, interdum vomitus biliosus, extremæque partes frigescent, urinæ crebra cupiditas, sed magna difficultas est, et quod inde excretum est, aquæ simile, vel rufum, vel pallidum est, paulum tamen in eo levamenti est, alvus vero cum multo spiritu redditur, utique in renibus vitium est. *Lib. ii. cap. 7. p. 60, 61.*

ding too long continued, great heats, strainings of the body, over-fullness of blood, sharp diuretics, poisons. 4. A spasmodic contraction or convulsive cramp in all the above mentioned small vessels, holding on for too long a time.

1.] Concerning the general causes of inflammation we before treated at §. 375. *et seq.* where we also explained how wounds, contusions, and tumours of all kinds, by their pressure on the adjacent vessels, may produce an inflammation.

Long lying on the back.] The kidneys are so seated that they lie partly incumbent on the lower side or crura of the diaphragm and quadratus muscle of the loins, and upon the side of the psoas muscle that bends the thigh: and therefore they are agitated by the diaphragm in our breathing, and by the said muscles of the loins while the body is in motion. Thus there is a fair provision for preventing any easy stagnation or concretion, more especially while the body is daily kept to healthy exercise. But, on the contrary, such persons as lead a more sedentary or inactive life are for the same reason much oftener observed to be afflicted with disorders of the Kidneys. From hence Sydenham^a assures us, that almost all gouty patients become subject to the gravel: and it has been an observation, that the same malady will spring up in such as are obliged to lie a long time unexercised in their bed for the cure of a broken thigh, more especially if they are of a corpulent habit, altho' they never were before troubled with any nephritical complaints; for when corpulent persons lie long on their back, the kidneys and ureters are then compressed by the weight of all the fat of the abdomen.

Violent strainings of the body.] For at such a time all the muscles of the whole body are very much swelled; as statuaries have very beautifully expressed, when they represent Hercules labouring. But a muscle, while it swells by action, looks pale at the same time,

^a Traſtat. de Podagra, p. 600.

time ^b, from an expression of all the blood out of its veins, while the arteries likewise are compressed so as to deny admittance to the red blood, suffering only the thinner juices to flow thro' the acting muscle ^c. While therefore all the muscles are in this strained condition at the time when persons exert their utmost strength of body, the red blood then continues to move almost only through the outward integuments and the internal viscera of the body; and that in a state deprived of the thinner juices, now collected in all the swelled muscles; and of course it will thence find a more difficult exit thro' the smallest vessels than before. At the time also, when the body exerts its greatest strength, the inspired air is retained in the lungs; whence the jugular veins appear swelled, because the free passage of the blood from the heart through the lungs is now much impeded; thence again the arteries will have more difficulty to empty themselves into the veins, now over-filled. But from all these causes the blood-vessels, of the viscera more especially, are immensely distended; and their smaller lateral branches for the reception of the thinner pellucid juices become so far urged, as to admit by an error of place grosser parts than can flow through their extremities; whence obstruction and inflammation may follow; or else a sudden rupture of the vessels, more especially if the solids are of a weak texture. How often are there spittings of blood, bleedings from the nose, and apoplexies suddenly fatal, from this cause? as numberless observations testify. Whence it easily appears why the whole skin looks so very red in violent strainings; and why the most dangerous inflammatory diseases often arise from thence, in persons who wrestle or use other violent exercises beyond their strength. If therefore, with respect to the kidneys, we consider they are fastened to some of the strongest muscles of the back now swelled with action, while the diaphragm and abdominal muscles at the same time powerfully compress the viscera; considering also the amplitude of the

^b H. Boerhaave *Inst. Medic.* sect. 401. n^o 7.^c *Ibid.* sect. 406.

the emulgent vessels; it will from all these plainly appear, what a force the kidneys sustain in a violent exertion of one's utmost strength; more especially when the body, being bent forward, endeavours to raise itself upright with some great weight, in which case the muscles of the back operate with a prodigious force. Violent straining therefore of the body may be a cause productive of an inflammation in the kidneys, by compressing and obstructing the final extremities of their arteries, and likewise by urging the gross red blood into the uriniferous tubes which naturally transmit only pellucid juices that are much thinner; and it is on this last account that overstraining of the body is in the third number of the present aphorism again reckoned among the causes of a nephritis.

A small stone] May cause a nephritis, by irritating or wounding the kidneys with its asperities, or by its bulk compressing the contiguous vessels. But upon the Stone we shall hereafter treat professedly in a distinct chapter.

2.] For the humours to pass freely through the kidneys, requires an open passage through the secretory uriniferous tubes which generally bear the name of *Bellini*, that they may be able to discharge the urinous liquor they separate into the papillary branches of the pelvis, into the pelvis itself, and by that into the ureters and bladder; every impediment therefore to this discharge may occasion an inflammation of the kidneys, and this the sooner as the obstacle is nearer to the kidney itself. For all the parts above the obstacle will in this case be distended, by the secreted urine unable to escape: from whence a compressure of the adjacent vessels, and frequently a very wonderful enlargement of the kidney itself, has ensued; of which you may see an instance in Ruyfch ^d.

3.] Although the secretory tubes of the kidneys do in their natural state drain off only the watery part of the blood, with such useless matters as are dissolvable in water; yet practical observations inform us, that they

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• Observat. Anatom. Chirurg. obs. 15. p. 15. et obs. 22. p. 92.

sometimes become so far dilated as to transmit even the largest parts of the blood. I have known many, who, by much riding in a coach, have discharged bloody urine, without any pain, or the least suspicion of a stone; and by a few days of rest the malady has perfectly disappeared. Since therefore the excretory ducts of Bellini may be thus so dilated as to let through the most gross or red parts of the blood; the same or a like cause, or even one less violent, will be able, in persons that have a weaker state of the kidneys, to force the grumous or red blood into the dilated beginnings of the uriniferous or excretory ducts, without being able to pass their whole length into the pelvis of the kidney. Thus therefore an obstruction, and consequently an inflammation, may ensue.

Running,] we know, does by the strong actions of the muscles greatly quicken the motion or return of the venous blood to the heart, which increases the velocity of the circulation; and that to such a degree as may drive the grosser humours into the finer vessels, from whence inflammations with all their consequences may follow, as we before proved at §. 100.

Horse-riding too violent or long continued.] How much benefit may be expected from this exercise in the most stubborn chronic distempers, has been in several places taught by Sydenham: for as every part of the body is thereby shook or exercised without tiring or exhausting the patient's strength, the weakest persons may thus reap the benefits of bodily exercise. But here we may observe the shocks from horse-riding, as well as those from violent driving in a coach over rough or stony ways, will cause a more copious secretion of the urine than at other times; and therefore in a given time the blood is thus applied more copiously, or with a greater impetus, or with both, to the secretory organs of the urine. Violent or long-continued horse-riding may therefore dilate these smaller vessels enough to receive the grosser fluids, and thereby produce a nephritis or inflammation of the kidneys; whence Aëtius, treating on this malady, justly pronounces, "That the kidneys become inflamed by a great num-
ber

“ber of causes; for corrupt or morbid humours,
“wounds, contusions or attritions, and the taking of
“medicines, may generate this inflammation, but
“more especially violent or long-continued horse-ri-
“ding^e.” I have sometimes seen bloody urines from
this cause, and in quantities so profuse as to endanger
the life of the patient by exhausting the blood-vessels;
for, by a too long continuance, this cause so far dilates
the renal ducts, that at length they transmit even the
blood itself. While I am writing this, such a patient
is now under my care, who has been all his life-time
used to the most violent horse-riding, and by great skill
in horsemanship or menage can soon bring the most
unruly horses to obedience, and teach them a due suf-
ferance of the bridle. This man, by frequent bloody
urines of this kind, without any pain, is become per-
fectly pale, exhausted, and in a languishing condition.
But when once his malady ceases or abates, and has al-
lowed him to gain some strength; by indulging again
with horse-riding, he exposes himself to relapses; in
which respect his frequent recoveries have rendered
him too audacious. Several cases of this kind have
taught me why Aretæus should pronounce, “Some-
“times blood copiously and suddenly breaks forth
“from the kidneys, and incessantly flows for many
“days: yet such die not of the hæmorrhage, but of a
“phlegmon formed with the hæmorrhage, if the blood
“shall happen to be arrested in its way out. But such
“generally die of a retention of the urine in the blood,
“arising from the violent inflammation of the kid-
“neys^f.” From this observation of Aretæus it ap-
pears, the same cause which makes the hæmorrhage
by breaking, or oftener by dilating, the vessels, may
also produce a most dangerous inflammation from a
stuffing up of the smaller vessels with impacted blood
that can get no exit through their extremities.

Great heats.] For by heated air the most fluid parts
of our humours are dissipated, and the blood becoming
more dense or thick is also of a redder colour and more
acid;

^e Serm. xi. cap. 16. p. 268.
Acutor, lib. ii. p. 22.

^f De Causis et Signis Morbor.

acid; from whence again the strangury ^g may arise. It is therefore apparent, that heat may be also reckoned among the causes of a nephritis; more especially when others of the foregoing causes likewise concur, namely, horse-riding, or running on foot.

Straining of the body.] Concerning this head we have already treated at the first number of the present aphorism.

Over-fullness of blood. Concerning a plethora we treated at §. 106; where it also appeared, that too great a quantity of good blood might produce inflammation. But then this cause is a general one, that may produce a phlegmon throughout the body: for which reason another cause is required to concur with the plethora, to fix the inflammation rather upon the kidneys than upon other parts; as for example, when a plethoric person shall addict himself to violent or long-continued horse-riding, or to quick travelling in a coach over rough ways.

Sharp diuretics, or poisons.] How much cantharides and many other caustic insects are able to irritate and inflame the urinary passages, is universally known. But acrid or caustic substances were before (§. 375.) justly ranked among the causes of inflammation: if therefore such of these are taken into the body, as by their peculiar tendency operate chiefly upon the kidneys, ureters, and bladder, being also very acrimonious, it is sufficiently evident an inflammation is thence to be feared in these parts. But it appears there are poisons of a much more subtle nature able to produce these mischiefs; as *Otto Tachenius* ^h had reason to lament, by his own sad experience: for, endeavouring to render arsenic fixed by repeated sublimations, after that operation had been often reiterated, upon opening the glass-vessels he smelt a most pleasant odour arise from it, which too incautiously he breathed into his lungs; but in consequence of this, within half an hour's time, amongst other malignant symp-

^g H. Boerhaave Instit. Medic. sect. 746.
cap. 24. p. 149.

^h Hippocr. Chemic.

symptoms, he made bloody urine, with an intolerable pain of burning.

4.] In hysterical women and hypochondriacal men we are sometimes surpris'd with a profuse quantity of watery urine, wholly without smell or taste, amounting to many pounds, and immediately consequent upon some sudden disturbance of the mind. But in this case we know the renal secretion is increased beyond its usual or former quantity; and that the uriniferous ducts within the kidneys are at the same time so straitened that they transmit only the most watery and thin parts from the blood. If therefore this cause continues upon the patient, or makes a frequent return, the blood, thus deprived of its more fluid parts, will be apt to hesitate in the final straits of the arteries; or else, being driven with a greater force into the kidneys, will enter into the dilated orifices of the smaller vessels, through the ends of which it cannot gain an entire passage. By either of these ways comes an inflammation of the kidneys. Moreover, we see in such patients, that even the larger blood-vessels are contracted with a cramp-like or convulsive force, by which they refuse a passage to their contents; as we are taught by the pallid contraction of their face, or cadaverous visage, which in these persons is apt to follow upon the least fright. Sometimes even the œsophagus, however ample in its capacity, is here thus cramped to such a degree that the patient can swallow nothing for several hours; and the same effect we know to follow from the same cause in the stomach and intestines. It will be therefore no wonder if in hysterical and hypochondriacal affections the vessels of the kidneys are sometimes so convulsively cramped as to deny a passage to the common humours that in health distil through these ways. Now such a straitening of the vessels we before reckoned among the causes of an inflammation, at §. 375; And practical observations confirm to us, that in hysterical patients sometimes the renal vessels are so far constricted as to transmit either no urine at all, or very little. Thus we read ⁱ of an hysterical nun,

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who

ⁱ Academ. des Sciences, 1715. Hist. p. 15.

who, after pains of the belly, with inflations and convulsive motions, fell into a suppression of urine, and had a vomiting of urine for above forty days afterwards; during all which interval she passed no urine but about an ounce in a day, which came not without the use of a catheter. This ischuria ceased of its own accord, and again returned after six weeks, with such a violent constriction of the urethra, that a catheter could by no means be introduced into the bladder. But in this case the urine vomited came up without any commixture of the other contents in the stomach. We have an account of such a wonderful suppression of both the urine and stools in an Hebrew girl who was hysterical, described in the *Acta Petropolitana* ^k by the celebrated *P. Ant. Michelotti*; which may be also read in the *Acta Eruditorum* ^l. But inflammations are the more rarely produced by these hysterical spasms, because the blood is commonly very thin in such persons; and if they should be once formed, they are for the same reason easily dispersed when the spasm of the vessels is removed. But it sometimes happens, that a calculus of no great bulk, lodged in the pelvis or ureter of either kidney, shall by its roughness so irritate these very sensible parts, that both kidneys will by the convulsive constriction be rendered unable to send off any urine into the bladder. Such an ischury I have sometimes observed in those who have had a fit, from the gravel descending thro' the ureters into the bladder, for the first time, even when there was no suspicion of any disorder in either kidney: but as soon as the calculus was fallen down into the bladder, and the sharp nephritical pains were abated, there has been a copious discharge of urine within a few hours. But the little stone here, that has been some days after discharged in the urine, has appeared rough indeed, but of so very small a bulk as to render it quite incredible that the ureter should be stopped by such a calculus; whence there has appeared no other reason why the separation of the urine should not have continued on, by one kidney or the other, but that here assigned, *viz.* a

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^k Tom. I. p. 368, &c. ^l Mensē Novemb. Anni 1726. p. 517, &c.

convulsive constriction of the vessels of the kidneys, to be ascribed to the severity of the pain. I confess indeed there may be a suspicion, that, in such a case, the other kidney has been rendered useless by some precedent disease, or that the ureter of the said kidney was long before plugged up with a larger stone: but then I have seen the same suppression of urine in other patients, who have never before had any signs or symptoms from whence one might infer such a malady in either kidney. What has been here advanced will, I believe, appear further confirmed by the following practical observation, for the communication of which I am indebted to the eminent physician Dr Paul de Wind, who practises physic with great applause at Middleburg in Zealand, and is no less eminent likewise for his dexterity in the most important operations of surgery. A woman, after she had been happily delivered, had a regular flux of her lochia, but an entire suppression of the discharge by urine: yet there was no tenesmus or desire of making water, nor any tumour or distension of the bladder; only she felt a slight pain in the left side of her abdomen. After various endeavours tried without success, a catheter was on the fifth day of the malady passed into the bladder, but without any discharge of urine. Upon the next day followed a vomiting that was almost continual; and although her lochial flux continued, without any considerable fever, yet she expired on the eleventh day from her delivery; and during all that time the patient only twice made a few drops of urine at distinct intervals. After the body was opened, there appeared no fault either in the womb, bladder, or ureters, nor in any of the other viscera of the abdomen; only the kidneys seemed both of them to be inflamed, yet they were not preternaturally swelled. In the left kidney was found a rough calculus, about the size of a pea. Now it here seems highly probable, that this rough calculus was by the ultimate throes in the delivery violently wedged into the kidney; from whence such a convulsive spasm or constriction ensued, in all the vessels of each kidney, as wholly precluded any se-

paration of the urine, till the patient expired.

§. 995. **I**F a violent inflammation takes up its residence in these small vessels of the kidneys, they are often so much constricted as to let through none of the urine: or sometimes the degree of constriction is such as transmits only a small quantity, or a urine that is very pellucid, thin, or watery, which is one of the worst signs. By an irritation of the nerves that join to those of the kidneys, and others that are adjacent, this malady excites pains and convulsions through the stomach, mesentery, intestines, and ureters; from whence follow belchings, sickness, vomitings, purgings, iliac passion, a suppression of the urinary secretion, a stupor and immobility of the lower extremities, and a burning heat in the loins.

It was before declared at §. 993. that the larger vessels filled with impervious blood might so swell, as to compress the smaller ones that lie contiguous, and thus wholly intercept the secretion of the urine: or that if as yet some small quantity of urine could pass the smaller vessels, it must be merely thin and watery; from whence the more acrid salts and oils of the blood being retained, which ought naturally to be excluded in the urine, there must soon follow thence a destruction of the most fine and tender vessels in the body; of which death is the consequence, commonly preceded by the symptoms of a disturbed brain, a delirium, sleepiness, and convulsions. Upon these accounts Aretæus^a feared nothing so much in acute diseases of the kidneys as an intercepted urine, which he pronounces speedily fatal to those in whom it is total or entire; and observes that tremblings, convulsions, cramps, &c. follow after a retained urine from this cause; to which he adds, a disturbed sleep, a waking suddenly in frights, and a delirium. Hildanus^b laments the

loss

^a De Causis et Signis Morb. Acut. lib. ii. cap. 9. p. 22.
Lithotomia Vesicæ, cap. 22. p. 749.

^b De

loss of his eldest son from this cause at the age of seven years: for being seized by a pain in his loins, joined with a fever and suppression of urine, he expired on the seventh day of his malady, altho' several eminent physicians gave their assistance. Upon opening his body, they found a violent inflammation of the kidneys and parts adjacent, having entered upon a gangrenous state.

By an irritation of the nerves that join to those of the kidneys, &c.] We lately observed, at §. 993. that from an inflammation of the kidneys various symptoms are sometimes produced in other remote parts of the body, although the cause itself of the complaint resided only in the kidneys; and that on this account the diagnosis of our present malady became often disturbed or obscured, from the number of other parts drawn into injury of their functions.

But this in no case appears more evidently than where a calculus, descending from the kidney through the ureter into the bladder, does by its bulk or roughness greatly irritate these sensible parts. For, in that case, almost all the symptoms enumerated in the present aphorism may be observed; and sometimes even the most experienced in practice are misled, especially when the patient lies under the first fit of a gravelly complaint or nephritis. But an error in this diagnosis seldom proves of any damage to the patient, as the antiphlogistic treatment, by the most emollient medicines, drinks, and clysters, are equally serviceable in nephritical as in colicky or intestinal complaints, which we a little before remarked. But then in these circumstances a prudent physician, acquainted with the difficulty, will not be over-hasty to pronounce or determine the kind of the malady; more especially if he considers the disorders of the intestines are, from the consent of parts, or irritation of the conjoined and adjacent nerves, sometimes attended with the same sort of symptoms as seem to point at a latent malady in the kidneys or bladder. This is even an admonition given us by Aretæus, where he treats upon colics: for he says, *If in colicky patients the kidneys and bladder are*

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drawn

drawn in to sympathise or bear a part in this pain, an ischuria is the consequence. In other parts, different symptoms arise, from different sympathies or consents. But the greatest wonder here is, that so sudden a pain should invade the testicles and their cremaster muscles. This sympathy, or communication of the disease by consent of parts, is what many physicians are not acquainted with: and even some have been extravagant enough to extirpate the cremaster muscles, under a notion that they harboured the proper cause of the malady; and from the like ignorance others have with equal absurdity ill treated the other sympathising parts^c. Even sometimes the iliac passion, and that very fatal, has followed after the symptoms that point out a disease of the kidneys or bladder; which Hippocrates seems also to declare when he says, *Those who have an involution of the gut* (i. e. an iliac passion) *following after or from a strangury, perish within seven days, unless a fever shall arise with a copious flux of urine*^d. Galen in his comment to this aphorism doubts whether it be genuine; and distrusts whether ever Hippocrates or any others have observed such a case from a strangury. But it is with the utmost truth I can affirm it has fallen under my own observation; for in a patient that had a strangury in a fever, an iliac pain or passion ensued, and was followed with a copious discharge by urine, from whence he recovered. But that this is a rare case, I readily believe; since I have but once met with it in a very numerous and extensive practice, during the space of twenty-five years. From whence it appears, that great precaution is necessary to distinguish a nephritis from other complaints. We read a wonderful observation in Jacotius, where the cause of the distemper

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^c Ren et vesica in partem hujus doloris adducuntur (συμπαθεῖα πονα,) ischuria fit. Istitis alia pro aliis accedunt. Miraculum autem his majus est, quod in testes et cremasteras inopinatus dolor invadit. Multos Medicorum haec communicatio morbi (συμπαθεῖν) latet: siquidem nonnunquam et cremasteras exsecuerunt, propriam morbi causam eos continere opinati, quo circa et his pro aliis alia fiunt. *De Causis et Signis Morbor. Diuturn. lib. ii. cap. 8. p. 59.*

^d Quibus ex stranguria volvulus succedit, intra septem dies intereunt, nisi oborta febre copiosa urina effluat. *Aphor. 44. sect. vi. Charter. Tom. IX. p. 276. et Coac. Prænot. n° 475. Ibidem. Tom. VIII. p. 879.*

per was found in the heart and thorax, although it was attended by symptoms of a nephritis. His words are: *And in a certain doctor of the university of Arles we saw a difficulty of the urinary discharge, with a violent pain of the kidneys, and a reddish sand or gravel; but the body of this person being opened, we found the kidneys perfectly healthy, while in the thorax we saw a dropsy, and a concremented stone within the heart^c.* We could allege many more instances, observed in the human body, which inform us, that, some parts being irritated, violent commotions have thence followed in others very distant; by which commotions nature has endeavoured to throw off or remove the oppressing and irritating matters or cause. When in delivery the mouth of the womb begins to be dilated by the protruding waters or head of the infant, pains follow thro' the loins, whence the abdominal muscles contract repeatedly with a convulsive force, that gradually increases more and more as the mouth of the womb opens: till at last, in the ultimate throes, the pains are the most violent; and followed with such powerful constrictions of the abdominal muscles and diaphragm, as suffice to throw out the foetus, and sometimes even to separate the symphysis or cartilaginous union of the bones themselves which form the pelvis. But if any one shall imagine this irritation of the circumjacent parts rather arises from some calcitration or struggling of the foetus itself in the womb; and that thence follow the muscular spasms, rather than from the irritation of the mouth of the womb; let him consider, that this last is the sensible part, which, being first touched by the deliverer, is perceived to send pains following throughout the womb and other parts, and is therefore made the index of the consequent pains; which pains are even again renewed, when, after the birth, any grumous blood or other remains urge for exclusion upon the said os uteri. But of these particulars we shall speak more at large in a distinct chapter upon the dis-

^c Ac certe vidimus in doctore Arelatensi urinae difficultatem cum maximo renum dolore, et arenulis rubentibus, cujus dissecto cadavere renes integri inventi sunt, sed in thorace hydrops, et concretus in cordis lapis. *Coac. Prasug. Hip. cum. Cam. Holleri et Jacotii, p. 824.*

diseases of child-bed women. Only for the present we have chosen these pains of the delivery, to give an example of the manner in which an irritation of some nervous parts may send pains and convulsive contractions into other neighbouring parts; and the rather because nephritic pains are sometimes so severe, that Hippocrates has compared them to labour-pains: For in treating upon diseases of the kidneys he says, *The pains urge upon the patient at the lower ribs, in the flanks or sides, in the loins, and in the muscles that surround the loins, so as to make him suffer the like as a woman that is taken with her labour-pains*[†]. So likewise Aretæus[‡], treating upon a gravelly nephritis, uses the same word (*ωδινον*) *birth-pains*, to denote that violent tenesmus, or fruitless and painful endeavour to void urine, that is observable in these patients.

§. 996. **A** NEPHRITIS is cured, under the helps of nature and clemency of the malady, 1. By a resolution, or melting, of the inflammatory cause; 2. By a continued and copious flux of urine that is thick or turbid, and reddish, before the seventh day of the malady, or at farthest by the fourteenth; or, 3. By the bleeding piles, when they flow plentifully in the beginning of the distemper.

In the cure of a nephritis, we here consider it as an inflammatory disease, without having regard to any distinction taken from the remoter causes. For whether the inflammation be formed in the kidney from a small stone, or from the other causes before enumerated §. 994, there will be no difference as to the treatment, which we shall shew at §. 1000.

But we have already made evident, in the inflammatory diseases of which we have before treated, that there

[†] Dolores eum ad hypochondrium et ilia premunt, et ad lumbos lumborumque musculos, et patitur similis ac mulier partus doloribus correpta. *De Internis Affectionibus*, cap. 18. *Charter. Tom. VII. p. 651.*

[‡] De Causis et Signis Morbor. *Diurn. cap. 3 p. 53.*

there is a two-fold method of curing them; one by the helps of nature, the other by assistance from art: all which is likewise true of the present malady; and therefore in the next aphorism will be considered the cure of a nephritis by art, as in the present is considered the manner in which nature may cure the same distemper without much help from art. We also before shewed, at §. 886, that the cure performed by helps from nature is performed two ways; either by a mild or insensible resolution, or else by a concoction and excretion of the morbid matter. But that such a cure may be performed by the help of nature only, the powers ought to be entire, and the distemper not very violent or stubborn. Both which may be known from the slightness of the symptoms: for the natural powers will be more broken, and the disease worse conditioned, as there are a greater number of the functions vitiated, and with a greater degree of injury.

1.] What the resolution of an inflammatory distemper is, and what circumstances are required to give hopes for obtaining it, we have before described in the history of a Peripneumony §. 830, no 1. and in that of a Pleurisy, at §. 887.

2.] This is that cure of the present malady which is indeed performed by the helps of nature; yet not by a simple resolution, but by a concoction and excretion of the matter of the distemper, upon which we have so often treated under the inflammatory maladies that have been before considered. We there made it appear, that the matter of the distemper, being once dissolved and rendered fluxile, very frequently discharged itself in the urine. But when the kidneys themselves are the seat of the distemper, one may easily perceive that the shortest, most natural, and easiest way for the dissolved matter of the distemper to escape must be through the ureters and bladder: for when once the matter, which caused the nephritis by being impacted into the renal ducts, melts or dissolves, it is then in a capacity to complete its course through their extremities, and fall thence into the pelvis and ureter. Therefore, in pains of the kidneys,
Hippo-

Hippocrates tells us we are to expect a discharge of gravel or of a thick urine: his words are, *A sudden pain of the kidneys, with a suppression of urine, denotes a consequent discharge of gravel, or of a turbid urine*^a. And Aëtius, treating upon inflammation of the kidneys, says, *After inflammations in these parts concocted, the urines are voided thick and copious, and that which subsides is good; and it is these urines, chiefly, that critically terminate and carry off the distemper: but watery urines, and such as are uniform and pellucid, denote a difficulty in throwing off the distemper*^b. Here we are to observe, that Aëtius praises those urines which afford a good hypostasis or sediment; which was before remarked likewise in other inflammatory distempers §. 830, 888, and 923. But in a nephritis that is inflammatory, those are also good urines which appear thick, although the matter discharged may not subside and form a distinct and even hypostasis; which yet is a sign to be suspected in other diseases. But the reason of this difference is, that, in other acute distempers, the matter of the disease, being dissolved and rendered fluxile, must remix with the blood, pass the lungs, and circulate with the blood through the arteries before it can escape through the kidneys; nor can it all pass out presently by this emunctory, but is obliged to suffer the repeated actions of the lungs and arteries, which in a manner densify and levigate its parts, that are thus adapted to form a copious and even sediment in the urine. But the matter of the distemper lodged in the kidneys is under no such necessity of remixing with the blood; but may, immediately upon its colliquation or dissolution, descend and escape with the urine in a more fleecy or fluctuating state. Thus I have seen, that in an inflammatory nephritis there has been discharged a thick, brown urine,

^a Renum dolor repentinus, cum urinae suppressione, calculorum aut urinarum crassarum mictionem significat. *Coac. Praenot.* n^o 589. *Charter. Tom. VIII.* p. 887.

^b A concoctis inflammationibus urinae his prodeunt multae et crassae, et in quibus bonum est quod subsidet, atque hae ipsae maxime judicant ac secernunt morbum: aquosae autem mictiones, et purae ac pellucentes, aegre morbum secerni indicant. *Sermon.* xi. cap. 16. p. 270.

urine, almost like small coffee, attended with the best consequences; which yet is an urine of no such good presage in other distempers. But even Hippocrates, after treating upon various urines as signs from whence one may deduce presages in diseases, gives the following just admonition: *But do not mistakenly affright yourself, if the bladder, being afflicted with some distemper of its own, shall discharge urines with these appearances; for the urine is then not so much a critical index to the whole body, as to its own peculiar passages^c.* But it is evident enough this admonition holds true no less of the kidneys distempered than of the bladder, into which last it falls from them in a direct course: and therefore Galen^d in his exposition of this text of Hippocrates, extends the present admonition to maladies of the kidneys.

But then to make a complete cure of the nephritis, without leaving another distemper behind, such a thick urine ought to be voided before the seventh day; because otherwise there will be reason to expect a consequent suppuration, as we shall hereafter shew at §. 1001. And the same we have observed in a Peripneumony, §. 830. and in other inflammatory maladies. But when the distemper has little violence, and the matter very slowly dissolves, the like urines have been observed salutary upon some other critical day following after the seventh: but when the fourteenth day is once past, we are to fear a suppuration, or else a scirrhous induration of the inflamed kidneys, rather than to expect a cure by any excretion of morbid matter; since such a delay in the time sufficiently points out the difficulty of resolving and removing the said matter.

3.] A copious flux by the piles makes a derivation both of the quantity and impetus of the blood from the kidneys. For the resistance to the blood moving through the abdominal viscera is thus diminished, whence a greater quantity will flow thro' the coeliac and

^c Ne vero te fallat, si vesica aliquo morbo laborans hujusmodi urinas reddat; non enim totius corporis, sed ipsius per se indicium est. *In Prognostic. Charact. Tom. VIII. p. 637*

^d Ibid. p. 638.

and mesenteric trunks, and consequently the blood will less urge upon the kidneys. Therefore it is observed in the text, that this hæmorrhoidal flux is more especially of service when it comes “in the beginning of” the distemper;” whence it seems to be beneficial not so much by evacuating the matter of the disease, as by lessening the impulse of the blood on the back of the obstructed vessels, whereby the matter being not so deeply wedged into their final straits, and less compressed, may so much sooner and more easily be resolved. We have already seen how the hæmorrhoidal flux may be of service in phrenitical patients, §. 779; and likewise in pleuritic cases, §. 888. n^o 1. That the same flux is also beneficial in a nephritis, we are assured by Hippocrates: *The piles flowing in melancholic and nephritical patients, is salutary*^c. And Galen^f assures us that he has observed an untimely stoppage in a customary flux by the piles has in some persons brought on a nephritis.

But in what manner these salutary endeavours of nature for the cure of the malady ought to be promoted, and what the proper remedies in this case are, we have before declared at §. 889, where we treated on a Pleurisy relieved by the same evacuation.

§. 997. **W**HEN a nephritis is known by its proper signs (§. 993, 995.) to be in the height of its inflammatory stage, it is then cured,
 1. By the general remedies proper for the cure of every inflammation; as blood-letting, revulsion, and dilution. 2. By decoctions that are easing, mollifying, and cooling, or antiphlogistic, taken in great plenty. 3. By clysters, fomentations, and warm baths, made up of the same materials. 4. By a diet that is moist and light, or emollient, with rest of body; avoiding the warmth of the bed,

^c Melancholicis et nephriticis succedentes hæmorrhoides Lomum. Aphor. 11. sect. vi. Charter. Tom. IX. p. 254.

^f Comment. 3. in lib. Hippocrat. de alimento. Charter. Tom. VI. p. 271.

bed, and more especially the habit of lying in it upon the back.

If now the nephritis appears in the more violent degree, without shewing any of those discharges by which experience assures us the malady is sometimes cured, we must then have recourse to the assistances of art for its relief.

1.] Concerning these general remedies we have already often treated as well in the cure of an inflammation as in the local inflammatory maladies hitherto considered. For the utmost precaution must be here used to prevent this phlegmon from ending in a suppuration, no less than in the inflammations of the other viscera. Perhaps a nephritis may by some be thought less dangerous when it suppurates, because, when the formed abscess of the kidney breaks, the matter may fall through the ureters into the bladder, and be from thence evacuated in the urine. But it will soon after be made to appear, that tho' the matter may have thus a passage that is short and easy enough for its discharge from the kidneys, yet the ulcer itself, which is formed in the kidneys, will be extremely difficult to cure.

2.] The use of these liquors we have likewise often before recommended under the inflammatory maladies that we have considered. But it must here be carefully observed, that such only are of service in this malady as are of the softest nature, and the least apt to irritate any inflamed part; for as in this distemper the urine is often voided with more difficulty and in less quantity than usual, the patient or those concerned in his cure will have recourse frequently to sharp diuretics, such as the turpentine, or balsams of the same kind, millepedes, &c. But the ancient physicians have very prudently admonished against the use of such things in the present distemper. Thus Tral-lian f orders such remedies to be chosen as are perfectly free from any acrimony or fretting quality; and therefore recommends a watery metheglin, or drink

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of honey: and sometimes in this malady he seems to fear even the softer diuretics, such as mead itself; instead of which, he orders only warm water to be plentifully drank. The like caution in the cure of a nephritis we also read in *Ægineta* ^g. Forms of remedies of this kind are given in the *Materia Medica*, at this number of the present aphorism.

3.] Clysters prepared from the most emollient decoctions, which *Ægineta* ^h also recommends, are here serviceable; in as much as they empty the large intestines, and mollify, relax, and foment the kidneys themselves, which are seated immediately upon the back of the colon. The celebrated Hoffman was of opinion ⁱ that the left kidney became oftener diseased than the right one, in nephritical patients, because it lies immediately contiguous to the flexure of the colon, which being often distended by flatus or hard fæces made a compressure upon the adjacent kidney. It must then be highly serviceable to have the colon disencumbered from those contents. But as for the use of warm bathings and fomentations, in as much as they act by resolving, relaxing, &c. we treated of them before, under the head of Pleurisy, at §. 889, n^o 2. and §. 890, n^o 2. These are also recommended for distempers of the kidneys by Hippocrates ^k; and Celsus sums up the whole together, thus: “ It
“ is necessary for the patient to keep himself at rest;
“ to couch or lie soft; to keep loose bowels, and if
“ they are not so naturally, to excite them by laxa-
“ tives: he must sit down frequently to bathe in warm
“ water, and avoid the taking of his drinks cold: he
“ must abstain from every thing sharp, salt, or sour;
“ from apples or fruits; but should drink plentiful-
“ ly ^l. ” It is true, indeed, that he afterwards recom-
mends pepper, leeks, and spurge, to provoke urine: but then the context sufficiently shews they were not to be used in the beginning of the distemper, while the inflammatory matter was crude or undissolved;
but

^g Lib. iii. cap. 45. p. 46. versa.

^h Ibid.

ⁱ Medic.

Ration. et System. Tom. IV. part. i. sect. 2. cap. 8. p. 465. ^k De Internis Affection. cap. 17. & 18. Chapter. Tom. VII. p. 650, 651.

^l Lib. iv. cap. 10. p. 217.

but after it was first digested or rendered fluxile.

4.] Concerning the diet and rest which are necessary in acute distempers, we have already often treated. But here the most lenient nourishments are very proper, since every thing acrid usually forces itself a way out chiefly by the urine, after being mixed with the blood; and therefore, by such nourishments, the inflamed kidney would be irritated with a sharper urine. For this reason Aëtius having enjoined abstinence from foods for the first day, nevertheless advises not to extend it further: *for that the urines being rendered more uniform and acrid by abstinence, occasion the most violent gnawing pains; and therefore those pains ought to be regarded, by the use of suppers that are lenient and nourishing in the beginning, joined with drinking of warm water*^m.

But how much relief is sometimes given in the cure of inflammatory distempers by causing those patients to abstain sometimes from the bed, has been taught us by Sydenhamⁿ; who observes, that blood-letting and the most cooling medicines will be used in vain to reduce the febrile heats, if the patient be all the time confined in a hot bed. But the heat of a bed is still more mischievous when the kidneys are inflamed; because, when the patient lies in that condition, the back is more heated than the rest of the body, while the parts affected are each way more compressed; and all this will be true in a worse degree if the person lies constantly on his back, in which state the kidneys will be considerably urged by the pressure of the superincumbent viscera. The ancient physicians have indeed advised the use of emollient fomentations applied hot to the region of the kidneys^o; but have at the same time cautioned against too much heat, for fear of exciting thereby a future suppuration. They have likewise condemned the use of cold applications, which

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might

^m Urinæ enim puriores et acriores per inediam redditæ, vehementissimos morsus infligunt: itaque in principio forbitionibus tenuibus morsus lenientibus connutrire oportet, et aquæ calidæ potu. *Serm. xi. cap. 16.*

p. 267, 268.

ⁿ Sect. iii. cap. 3. p. 205.

^o Trallianus, lib. ix. cap. 5. p. 542.

Ægineta, lib. iii. cap. 45. p. 46. versa.

might convert the inflamed parts into a schirrhus. But as prudence in all cases cautions us to avoid running into extremes, so more especially in regard to inflammations of the kidneys this precaution should be observed.

§. 998. **I**F the symptoms of pain or convulsions urge very violently in a nephritis, opiates may be serviceable.

What mischievous effects sometimes arise in the adjacent and communicating parts from an irritation of their nerves in a nephritis, was before declared §. 995. And even the symptoms of the present aphorism rage sometimes with so much severity, as to be no longer supportable by the patient, whose powers they have almost wholly exhausted; whence they may even go on to produce new maladies, more especially in a nephritis from stone or gravel. But since it is often not in our power to remove suddenly the cause of these mischiefs, nothing remains but to stupify or obtund the sense of pain in the patient; for this being effected, those cruel symptoms are soon silenced, the convulsions of the stomach and intestines are taken off, and the too great constriction of the inflamed vessels is relaxed, while in the mean time the powers of the patient are recruited by soft repose, and the cure goes better on. Concerning these extraordinary benefits from the use of opiates, we treated before more at large §. 202, and §. 229. But then we likewise there admonished, that these medicines only removed the sense of pain, without always taking away its cause; and therefore that all due care must be taken to continue in the use of those other medicines which are adapted to subdue the cause itself of the distemper. But prudent physicians seldom use these opiate medicines in acute or inflammatory maladies, until the violence of the inflammation is first abated by blood-letting and other suitable means. *Ægineta*^a recommends a use of the poppy in clysters, for a nephritis

^a Ibid.

§. 999, 1000. *Of a NEPHRITIS.* 29
tis. Aëtius ^b likewise praises an internal use of the poppy, and of opium, to relieve the pains.

§. 999. **B**UT when excessive vomiting is a symptom of this distemper, it is often serviceable to treat it with warm watery liquors, sweetened with honey.

When we treated of vomiting at §. 652, it appeared that a violent and convulsive contraction of the diaphragm and abdominal muscles attended in each vomiting, by the power of which muscles the contents of the stomach were forcibly expelled. From the known situation of the kidneys, it is plain they must be shook with considerable violence at the time of vomiting. If then we consider, that in this act the motion of the blood is much quickened thro' all the vessels, while the inflamed kidneys are at the same time roughly agitated, it will be evident enough that vomiting will do more mischief than service in a nephritis. But where this last malady springs from a calculus wedged into the straits of the pelvis of the kidney or its ureter, vomiting in that case may be of service, so far as it conduces to shake down the calculus to the bladder, more especially if the passages are first lubricated and relaxed with emollient decoctions, oil of almonds, and the like, taken inwardly. In such a case, it will be of use to fill the patients repeatedly with warm water sweetened with honey, that they may vomit more easily and with less anguish: for it is well known, nothing gives more uneasiness than continual endeavours to vomit while the stomach is empty. Consult here likewise what has been said in the comment to §. 654. But upon the signs of a stone in the kidney, we shall treat at §. 1422.

§. 1000. **A**ND it is by these means only, which we have above proposed, that one
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can safely cure that more eminent kind of the nephritis which springs from a calculus wedged into the kidneys or ureters.

A calculus in the kidneys is an unactive concreted body, which by its bulk and the roughness of its figure is able to irritate and inflame the sensible parts within its contact. However, there are many observations which shew us, that stones, even of a considerable bulk, but smoothly surfaced, have been found in the bodies of deceased persons; who yet never were suspected of being afflicted with such a disorder. But when a stone by the roughness of its figure injures the contiguous parts, or lies wedged into the straits of the ureter, the surrounding parts become then inflamed, and all the bad symptoms ensue which we before recounted at §. 993, 995. The inflamed parts become swelled in course, and return their pressure again upon the stone in proportion as they are more inflamed. And this circumstance has been well observed by Aretæus, where he recommends blood-letting for the cure of a stone in the kidney. For he tells us, “That inflammation keeps all the parts strained or swelled up; but that evacuation is the abatement or reduction of a phlegmon^a.” Afterwards he recommends such things as are emollient and lubricating, inwardly taken, and externally applied: For it is by this method only that one can safely prevent inflammation in those parts which are injured by a stone; or even remove the inflammation when it is once formed, and relax the passages by which the calculus must pass from the kidneys to the bladder. But all those remedies before recommended (§. 997.) conduce to this effect, and are therefore extremely useful for the cure of a gravelly nephritis; which will appear better confirmed hereafter, when we come in a distinct chapter to treat upon the stone, where we shall likewise speak of lithontriptics or dissolvers of the stone. Now many are of opinion, that the sharper diuretics may conduce to promote the passage of a calculus through the ureters

^a De Curatione Morbor. Acutor. lib. ii. cap. 3. p. 130.

ters into the bladder, in as much as they drive a greater quantity of urine to urge on the calculus. But the truth is, that the urine distilling insensibly thro' an infinite number of the most minute renal ducts, runs thence along the sides of the pelvis and ureters, in such a manner that the most powerful diuretics cannot by increasing this secretion give the urine a greater impulsive motion to thrust forward a small stone. On the contrary, these are mischievous in as much as by their sharper stimulus they increase the fever and the present inflammation, while they give a greater acrimony to the urine; from all which the painful parts are more irritated, and the several symptoms increased. Lenients therefore, with watery drinks, emollients, and soft oily substances, are alone serviceable in this case; that the urine may be afforded plentifully dilute, without almost any acrimony; and these will at the same time ease the pain, relax the parts that are drawn into a cramp or constriction, and lubricate the passages to the bladder. In the *Materia Medica* corresponding to the number of the present aphorism several medicines are pointed out, which being diluted or infused in plenty of water may well answer this intention.

§. 1001. **I**F the causes of the nephritis are great or stubborn, and the inflammation is neither resolved (§. 996.), nor otherwise cured (§. 997.), but runs on beyond the seventh day, a suppuration or abscess is then to be feared: And that it is about to *be formed* we are taught by the abatement of the pain, or a change of it into a kind of pulsation or throbbing, joined with a shivering that often returns, and a sense of heaviness or numbness in the affected part. But that the abscess is *completely formed*, is pointed out to us by the forementioned signs having gone before, followed with a pulsation, heat, and tension, about the affected part, and a purulent or fetid urine like unto a strong or saline urine that has
been

been putrified: And when once we thus know that such an abscess is formed, powerful maturatives are first to be used, with emollients; and after the urine appears purulent, the cure must go on with simple diuretics, in soft or nitrous spaw-waters, used in conjunction with the whey of new milk, balsamics, and the like.

After what manner, and from what causes, an inflammation may turn into a suppuration, was before declared at §. 387. And we formerly, in our history of a Peripneumony and Pleurisy, reckoned up those signs that acquaint the physician with the changing of an inflammation, seated in some of the internal parts of the body, into a suppuration or abscess: which signs do therefore here occur in like manner; such as, the remission of pain, a pulsation, vague shiverings, &c. which we need not repeat again in this place. If these signs shall have continued any time, we then know that an abscess in the kidneys is not barely approaching, but already there *completed*; and thereupon a new set of symptoms arise, from the compressure and distraction of the circumjacent parts by the renal vomica, not yet broken, but turgid with collected matter. The principal of these signs are well set down by Galen: *If pains, interrupted with a shivering, seem to return inordinately, and feverish heats invade in no regular succession, then order the patient to lie prone upon his belly, or at times upon either side, that the affected parts may be higher situated than the rest, and then inquire of the patient if he does not perceive a sense like that of a suspended weight about the painful kidney: For when these circumstances appear, one may reasonably conclude there is an abscess formed*^a. But sometimes there are other symptoms which accompany a renal vomica.

Thus

^a Si dolores cum horrore interpolato inordinatim fieri videantur, et febres absque ullo ordine; tum primum in ventrem decumbere jussim, atque interdum in alterum latus, ut sublimis sit affectæ partis situs, laborantem interroga, num circa renem dolentem veluti suspensi cujusdam ponderis sensum percipiat. Etenim quum hæc ipsi acciderint, abscessum colligi conjicere oportet. *De Locis Affectis, lib. vi. cap. 3. Charter. Tom. VII. p. 510.*

Thus I have known a kind of burning pain in a nephritic patient, that extended as high as the scapula and arm-pit of the same side: And Hippocrates^b has told us that a strangury attends upon a suppuration of the kidneys. Yet these are symptoms not to be observed in all patients; but those signs that we before enumerated from Galen are constantly to be observed. But when the abscess is mature, and shortly about to break, then an acute pain is felt, instead of one heavy and obtuse; namely, while the membranes that contain the collected matter are now upon the point of bursting, that the matter may descend by the ureters, and escape with the urine. But, the vomica being once broken, the matter discharged is almost constantly fetid, more especially if the vomica of the kidney has continued close for a considerable time; and the more so as it is formed in a part that naturally secretes and collects the urine, which is in itself a liquor so easily putrescent. But as the open ulcer afterwards clears itself, the matter then discharged gives not such a strong smell to the urine. The same thing is remarked by Aretæus, where he treats upon ulcerated kidneys: *But these ulcers are of a spreading or eating nature, whether they be cleansed or left foul; as is evident from the matter which they discharge: and the urine is also accordingly, either without smell, or very stinking*^c.

It is true indeed, that matter discharged in the urine, if it be considered alone, is no absolute sign of an abscess or ulcer in the kidney; since it may come from the ureters or bladder affected in the same manner: Whence Hippocrates cautiously pronounces, *If the patient voids blood or matter by urine, it denotes an ulceration either of the kidneys or bladder*^d. And we before shewed at §. 896, that sometimes matter collected in other parts of the body, being absorbed by the

^b Aphor. 59. sect. v. Charter. Tom. IX. p. 230.

^c Ulcera vero mordacia sunt, modo repurgata, modo sordentia: id pus manifestat; urina quoque aut olida aut nihil olens. Lib. ii. *De Causis et Signis Morbor. Diuturnor. cap. 3. p. 54*

^d Si sanguinem aut pus mejat, renum aut vesicæ ulcerationem significat. Aphor. 75. sect. iv. Charter. Tom. IX. p. 185.

the veins, has passed out from the body by the urinary passages. But the signs of an inflammatory nephritis having gone before, this purulent discharge by urine puts the case beyond all doubt; as Trallian^e well observes, who has moreover added other marks by which one may distinguish whether matter comes from the kidneys or from other parts. For if the matter was not collected in the urinary passages, but, being first from elsewhere absorbed, gains an exit through the kidneys in the urine, this last then appears most intimately mixed with the said matter, and makes but a very slow precipitation to the bottom of the vessel; because the said matter, being intermixed with the blood, was highly attenuated by the action of the lungs and arteries, and has passed thence with the secreted urine through the renal ducts. But when matter distils immediately from an ulcer of the kidneys, it is never thus intimately blended with the urine; but, soon after it is discharged, appears at the bottom of the vessel, separated from the urine. It seems indeed more difficult to form a diagnosis of the malady from a mere inspection of the purulent urine only, so as to discern whether the matter comes from an ulcer of the kidneys or of the bladder: but yet observations in the mean time inform us, that matter from the bladder is much more tenacious or glutinous, and directly subsides like slime to the bottom of the urinal; while matter from the kidneys appears more loose and fluctuating. Add to this, that in an abscess of the bladder there is discharged with the urine a sort of scaly or foliaceous fragments, which Trallian^f calls (*μυριαπτελωδη*) a *leaf-like abrasion*, which is probably an exfoliation of the interior lining of the bladder: But from a suppuration in the kidneys, particles more consistent and fleshy are discharged in the urine, which Hippocrates^g terms (*σάρκια σμικρά*) *small caruncles*, and tells us they come from the kidneys: but these are probably half-gangrenous parts from the substance of the kidneys themselves; for in the same manner we see, that,

upon

^e Lib. ix. cap. 5. p. 543.
 Charter. Tom. IX. p. 186.

^f Ibid.

^g Aphor. 76. sect. iv.

upon the breaking of abscesses in the external parts of the body, there are membranous fleeces of the cellular substance intermixed with the discharged matter. The diagnostic signs of a suppuration in the kidneys, ureters, and bladder, are also very well exhibited together by *Ægineta*^h.

But in a suppuration of the kidney there is a two-fold curatory indication: first, To promote the suppuration, that all the crude inflammatory matters may be expeditiously changed into laudable or inoffensive matter, whenever the nephritis cannot be better terminated; and upon this intention we treated in the chapter of an abscess, §. 402, 403. Here therefore will be serviceable the most emollient decoctions, to be drunk plentifully; with clysters often repeated and prepared from the like ingredients; to which add, warm bathing, and the application of cataplasms to the region of the kidneys. But, secondly, if we know from the perception of an oppressing weight, and the long continuance of the disease, with a great tension of the circumjacent parts, that there is a collection of ripe matter lodged in an abscess of the kidney; all endeavours must then be turned towards breaking the vomica, lest the matter should become putrid by long standing, and produce hollow ulcers of the worst kind spreading through the adjacent parts; or else lest, by returning again into the blood by absorption, it should there produce a purulent cacochymia and consumption. But for the breaking an abscess that is mature in the kidney, no remedy hardly remains but to make a violent concussion upon the kidney itself: and therefore coughing, sneezing, and riding in a coach, are the principal remedies by which we may expect such a rupture; after the same manner as we before advised at §. 857. where we treated upon the breaking a vomica or abscess in the lungs.

If, after the trial of such means, there should a discharge of matter follow in the urine, we may then be sure the renal vomica is broken; and by the various appearance or condition of the matter we may judge

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^h Lib. iii. cap. 45. p. 46. versa.

concerning the condition of the ulcer in the kidney. For if that appears smooth, white, and uniform; we may have good hopes of a cure; but, on the contrary, the presage will be so much worse as the matter discharged degenerates from that state. Yet it is to be observed, that the matter first discharged from the vomica is rarely at the breaking of it under the best conditions, especially if it has been close confined for a considerable time; for it is then commonly fetid, and sometimes bloody: but in the following days it is usual for the quantity of the discharged matter to lessen, and become of a more laudable appearance, as the ulcerated face of the abscess mends or cleanses; in which case there is reason to hope for an happy issue. The curative indication then is, To gently absterge and mundify the ulcerated parts, and afterwards to close or consolidate them.

But since we are by no means able to prevent the urine from continually watering the ulcerated kidney; it is therefore our business to mitigate the acrimony of the urine by copious drinks that are moderately detergent. The whey of milk here drunk plentifully, more especially in the spring or summer season, while the cattle feed upon the green pasturage, affords one of the best remedies; and will almost of itself suffice for a cure, since it contains almost the entire virtues of the herbage; in so much that the whey, after being well depurated, appears of a clear greenish colour, as if it were a diluted or thin juice of the grass, whose excellent virtues for the cure of ulcers in the kidneys have been recommended to us by Trallianⁱ. This last author also justly recommends the drinking of asses-milk, or milk of a mare; and Ægineta^k likewise affirms that those afflicted with the present malady are greatly relieved by drinking of milk. Aëtius^l, again, recommends the drinking of milk with honey, after the matter is discharged; beginning first with the milk from a mare or an ass, as they are conducive to cleanse the ulcer: But after the ulcer is once clean, he applauds the

ⁱ Lib. ix. cap. 5. p. 544.
fine.

^k Lib. iii. cap. 45. p. 46. versa in

^l Serm. xi. cap. 18. p. 271.

the milk from a cow, as affording more nourishment to the patient; and he then adds, “ Moreover, all milk
“ is to be given warm just after milking, the beast be-
“ ing for that purpose brought to the house where the
“ patient lies ill; and thus it is one of the best medi-
“ cines for the cure of other internal ulcers besides
“ those of the kidneys, proves very healing to the wa-
“ sting matter, and affords good nourishment to the
“ body.” But concerning the extraordinary useful-
ness of milk for the cure of ulcerated lungs, we have
before treated at §. 858.

To the same intentions will conduce likewise those mineral waters which, instead of a vitriol of iron, contain only a small proportion of a neutral or deterfive and healing salt; as the Selteran waters, and the like; the use of which, with equal parts of milk, is so universally approved by the general consent of physicians, for the cure of ulcerations in the viscera. Infusions and decoctions of the plants which are recommended in the *Materia Medica* at the number of the foregoing aphorism, will be here also of the like use.

But since balsams have been so much recommended by the most eminent surgeons for cleansing and healing external ulcers, physicians have been likewise induced to administer them for the cure of internal ulcerations, and more especially for those of the kidneys; because they appear to have a peculiar tendency or operation by the urinary passages, since within a quarter of an hour after taking them they usually make a remarkable change in the smell of the urine.

For it is well known, the turpentine, with the balsams copaiba, mecha, and the like native balsams, given in but a very small quantity, do impart to the urine a smell somewhat like that which breathes from violets flowering in March. And it is certain these balsams have their merits in such ulcerations of the kidneys, if they are given in but a very small quantity three or four times in a day; drinking after them plenty of the whey of milk, or of a soft vulnerary decoction. For if they be given in a larger dose, and without diluents, they over-heat the body and too much stimulate the parts;

or, imprudently given, they will even sometimes cause a very troublesome strangury, with an inflammation of the urinary passages. Yet these native balsams seem to be much preferable to any boasted artificial ones, which have often a much greater acrimony. I have in the course of practice seen very good effects from a dram of these native balsams incorporated with an ounce of the inspissated juice of liquorice; of which mass twenty or thirty grains are swallowed every four hours, drinking afterwards of the whey of milk, or of some other medicated drink before recommended. In the use of these the patient may persist till there is no further appearance of matter in the urine; and then to the same mixture may be added such things as heal and agglutinate, as gum mastic, olibanum, sarcocol, and the like. For ulcerations of the kidneys Celsus^m likewise recommends mild, balsamic, and deterfive medicines, composed of pine-kernels, with gourd-seeds, anniseeds, and a little saffron.

All that we have hitherto advanced concerning the cure of an ulcer in the kidney, supposeth, that the vomica being broken pours out its contained matter into the pelvis. For although the matter commonly takes this course for its evacuation, yet it sometimes inclines to make a way for itself through other parts. And Hippocrates accordingly observes to us, that a renal abscess sometimes points or shews itself outwardly. For in treating on a stone of the kidney he gives us the following passage, *When the pain in this case is urgent, make use of the warm bath, or washing in large quantities of a warm liquor, and apply fomentations made warm to those parts in which the pain principally resides. But when the abscess shall have increased its bulk, and pointed or projected itself outwardly, make then an incision into it near to the kidney; and, having extracted the matter, treat the patient, for the gravel, with such medicines as operate by urine: for if the abscess be thus opened by incision, there may be hopes of a recovery; otherwise, the patient must submit to be taken off by his distemperⁿ.*

And

^m Lib. iv. cap. 11. p. 217.

ⁿ Quum autem dolor urget, multa calida lavato; et qua parte præcipue dolor

And in the next chapter he pronounces, *When therefore the kidney is suppurated, it makes a tumour near the spine or back-bone. And when this is the case, make an opening in the tumour by a very deep incision. If now you shall have been successful in your incision, you may soon recover health to the patient; but if you shall have mistaken the proper opening, there is danger of its forming a fistulous ulcer.* And here we are to observe, that he advises the incision for the nephrotomy to be made deep; because one must pass through the skin, fat, and thick muscles, before the knife can reach the kidney itself. Moreover, he remarks, that unless one happily succeeds in the opening of the abscess, a fistulous ulcer ensues; because then the matter from the broken vomica of the kidney will burrow or insinuate, so as to form sinuosities in the cellular substance betwixt the muscles and behind the peritonæum, in a manner that is perfectly surprising both as to their depths and the various directions in which the matter seeks a way outward. Those who have a sinuous ulcer are by Hippocrates termed *Ἐμμοτοὶ* (*δια τὸ μοτῶν*), after the *lint* which is required to be armed with digestive remedies, and conveyed into such hollow ulcers for their cure. Aëtius has also remarked the like events from a renal abscess: *But in some nephritic patients, during the whole time the suppurated humours break not forth, but lie collected together about the kidneys for a long space of time, until an attempt be made to discharge it outwardly by an aperture made either by incision, by caustic or cautery, or otherwise* ^p. But in the end of the same chapter ^q he observes that ulcers of this kind opening

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dolor est, fatus tepentes admoveto. Quum vero intumuerit et extuberarit, sub hoc tempus juxta renem secato; et, extracto pure, arenam med. camentis urinam cientibus curato: si enim sectus fuerit, evadendi spes est; sin minus, morbus homini commoritur. *De Internis Affectionibus, cap. 15. Charter. Tom. VII. p. 649.*

^o Quum igitur ren suppuratus fuerit, ad spinam intumescit. Hunc, quum ita habuerit, qua parte tumor est profunda maxime sectione secato. Quod si quidem sectione affectus fueris, confestim sanum reldes. At si aberraveris, periculum est, ulcus fistulosum fieri. *Ibid. p. 650.*

^p Quibusdam vero neque in totum suppurata erumpunt, sed circa renes per multum tempus consistunt; donec cauteri adhibito aut alio modo forinsecus apertionem et educationem moliaris. *Serm. xi. cap. 18. p. 270.*

^q *Ibid. p. 272.*

outward, require a very careful treatment, since they commonly become fistulous. Even sometimes the matter will in part discharge itself by urine; while another part of it shall be collected in the back, and form there a projecting tumour in the integuments. In this condition I had a woman under my care, who had made purulent urine for several months, with a manifest tumour in the region of the right kidney; from which, being opened by caustic, because she was too much afraid of the knife, a considerable quantity of matter flowed out. But in the mean time no treatment from the most experienced surgeon could prevent a fistulous ulcer from remaining afterwards in the back; although the patient continued otherwise tolerably well in health, and made urine like that which is healthy or natural. Cabrolus^r saw a like case in a youth who had such an ulcer in his back, although he discharged some quantity of the matter in his urine. Upon making an incision into the part, no matter came out; but upon removing the dressings two hours after, a large quantity of matter broke out, and continued to flow for above a month: yet the patient got happily and entirely cured.

From what has been said, it is evident how grievous a malady it is to have an inflammation of the kidneys end in a suppuration, and how doubtful the cure must be. For although the abscess may tend outwardly, yet it sometimes breaks before all the parts incumbent on the kidney are sufficiently elevated or extended outwardly enough to be distinguished by the surgeon; and then the diffused matter often makes incurable sinuses, that spread through all the adjacent parts. Hippocrates seems also to have remarked this difficulty, when he says, *In those nephritical patients who have had the forementioned signs, which leave pains fixed about the muscles of the back; if those pains invade the exterior parts, you are also to expect future abscesses outwardly: But if the pains are formed more about the interior parts, you are rather to expect that the ensuing ab-*

abscesses will be inwardly formed ^s.

But since the kidneys are almost contiguous to the large intestine called the *colon*, and parts inflamed often grow one to another (see §. 843, and 897.), it seems not improbable but the kidney may so unite to the colon preternaturally, as to allow the abscess formed in the kidney to discharge its matter into the cavity of the intestine, that it may be afterwards discharged by stool. It is true indeed, that the kidneys are placed behind the peritonæum, and therefore do not immediately touch the colon; but it appeared at §. 936, that the diaphragm interposed betwixt the liver and lungs was not sufficient to hinder the matter from passing from an abscess of the liver into the lungs, to be by them discharged in spitting. Hippocrates seems to have pointed out such a passage of matter from the kidney, where he treats upon this disorder: *If indeed the matter breaks inwardly, and descends to the intestinum rectum, there is hopes of a recovery* ^t. And Aëtius likewise in the same distemper remarks, *But sometimes the eruption of matter descends to the intestines, and is evacuated by stool* ^u. In such a case, the like treatment will be convenient which was before directed for a suppuration of the intestines; for which see §. 966.

§. 1002. **B**UT if the said suppuration (§. 1001.) long continues, the whole kidney, being eat up, forms a mere capsule or bag of no use: and in this case a renal consumption is often present.

We see, that in long-continued suppurations of the

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^s Quibus nephriticis prædicta contingunt signa, doloresque circa spinæ musculos fiunt, si exteriora quidem loca occupent, abscessus quoque futuros exteriores expecta. Si vero dolores magis circa loca interiora fiant abscessus etiam interiores magis futuros expecta. *Apher.* 36. *lib.* 7. *Charter.* Tom. IX. p. 310

^t Si quidem pus intro rumpatur, et ad intestinum rectum feratur, evadendi spes est. *De Affectionibus*, cap. 16. *Charter.* Tom. VII. p. 650.

^u Aliquando autem et ad intestina eruptio devolvitur, et per sedem pus evacuatur. *Serm.* xi. cap. 18. p. 270.

external parts there is such a loss of the substance, consumed into matter, as leaves behind hollow and unsightly scars after the cure. The same waste of the substance is also to be feared when an ulcer of the kidney cannot be speedily cured; for even solid parts or sloughs, being separated by the suppuration from the substance of the kidney itself to which they were united, come away in the purulent urine under the form of caruncles, as we a little before observed. Hildanus even tells us of “pieces of the kidneys as
 “ large as one’s thumb, that were discharged through
 “ the urethra, with extreme pain and torment^a.” The whole substance of the kidney being thus exhausted, leaves a mere empty and membranous bag, of no use; and therefore the other kidney that remains will be obliged to perform the whole urinary secretion. Piso tells us of “a woman who had the outer membrane
 “ of the kidneys that is common to the ureters dilated into a capacity as large as the belly itself, yet
 “ so strong that it was able to sustain fourteen pounds
 “ of purulent matter without laceration^b.” And therefore this membrane or outer covering of the kidney must have gained considerable strength and thickness not to break by so great a weight of matter. But the following is to be read in Bonetus, extracted from Cabrolus: “That in a kidney thus suppurated, and
 “ weighing fourteen pounds, there was found a bag,
 “ including the matter, that was equal to the thickness of a sheep-skin^c.” It may indeed seem strange, that the whole substance of the kidney should be thus consumed without any fatal hæmorrhage, since the emulgent artery is of such a considerable magnitude and seated so near the heart. But we see, that a suppuration every where scarce makes any hæmorrhage in dissolving the extremities of vessels that have been obstructed with an inflammatory matter: in which case, even though the matter dissolves by degrees almost the whole substance of the part, yet a bleeding
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^a Hildanus de Gangraena et Sphacelo, cap. 4. p. 774. ^b De Morbis a Serosa Colluvie, sect. iv. cap. 2. p. 296. ^c Sepulchret. Anatom. Tom. II. p. 567.

very rarely ensues; for the ends of the vessels seem so to contract and be closed by the suppuration, as hardly to afford any further admittance to the blood, which then goes on through the other adjacent vessels that are free and open. Thus in amputations, when the wound affords matter over its whole surface, surgeons observe there is no danger of an hæmorrhage. It will also hereafter appear, when we treat upon a Pulmonary Consumption, that the whole substance of the lungs is sometimes consumed by the purulent matter, which is daily expectorated by copious spittings without an hæmorrhage; when yet the pulmonary artery is very large, and comes out from the heart itself which is so near.

From what has been hitherto said, we may also understand, why the ancient physicians esteemed the cure of a nephritis to be so very difficult, more especially if a suppuration followed it; for that then the matter could not be soon discharged, nor the ulcer be afterwards cleansed and consolidated. For thus Hippocrates, after having laid down what relates to the cure of a nephritis, says, *If the patient shall have been thus treated, and yet not speedily gain a cure, it will be nothing unusual; for it is a very stubborn malady*^d. And in a suppuration of the kidneys he observes, *But this is a very fatiguing distemper, from which many fall into a consumption of the kidneys*^e: For here the quantity of matter daily evacuated either consumes most part of the nourishment (as many patients, after great amputations, that have been well performed, perish by the same cause;) or the returning matter absorbed introduces a purulent cacochymia in the blood, equally destructive. And in another place, treating upon the same distemper, he even says, this malady hardly terminates; and instead of promising a complete cure, he only says barely, *If you follow this treatment, you will bring the malady into better conditions*^f. In the same

^d Hæc si fecerit, neque citissime sanescat, haud novum: morbus enim perdifficilis. *De Intern. Affect. cap. 18. Charter. Tom. VII. p. 651.*

^e Hic autem morbus molestus est, ex eoque plures ad renum tabem deveniunt. *Ibid. cap. 16. p. 650.*

^f Hæc si ita feceris, morbum meliorem statuas constitues. *Ibid. cap. 17. p. 650.*

same manner Aretæus^g, ranking ulcers of the kidneys among the lingering diseases, pronounces them rather incurable than mortal, and ending together with the patient. But he more especially condemns such of these ulcers as arise from small stones^h: *Insanabiles inde morbi nascuntur, cito colliquatio, et mors*; “for that
“incurable complaints thence follow, with a hasty
“consumption, and death.” For if the calculus be so large that it cannot descend through the ureters into the bladder, it will remain in the kidney, and there breed an ulcer, on which it will have the same effects as a ball or tent that is inserted to keep open the mouth of a fistula; that is, it will continually hinder the depuration and consolidation of the ulcer that is formed in the kidney. Aëtiusⁱ in like manner confirms to us this difficulty of cure upon his own authority.

§. 1003. **I**F the inflammation in the kidney forms there a schirrhus, it gives birth to a palsy or lameness in the thigh of the same side, which is then an incurable malady; and from thence often ensues a slow consumption, or a dropsy, &c.

We come now to a third way of terminating the nephritis, which ensues when the impacted matter in the vessels can be neither resolved nor suppurated, but hardens together with them into a scirrhus. It was before observed at §. 997, that Trallian and Ægineta have cautioned against the application of cold things, lest the distemper should turn to a schirrhus of the kidneys. Trallian indeed does not use the word *scirrhus*, but terms of the same import; *σκληρυνται τὰ νεφρῶν αἰ φλεγμοναί*, *Indurantur renum inflammationes*; as appears from Ægineta^a, who expressly uses the word *σκληρυνται*: and a little after^b, describing the same malady, he calls it *σκληρῆσαν νεφρῶν*, *an induration of the kidneys*.

^g De Causis et Signis Morbor. Diuturn. lib. ii. cap. 3. p. 52. ^h Ibid. p. 54. ⁱ Serm. xi. cap. 18. p. 272. ^a Lib. iii. cap. 45. p. 46. versa. ^b Ibid. p. 47.

neys. But a schirrhus, so long as it continues without malignity (see §. 486.) offends only by injuring the function of the part in which it resides, and by compression disturbing the actions of those parts that lie adjacent; being in other respects not painful in its own nature. But schirrhous kidneys, especially if they are much increased in bulk, may compress the psoas muscles, and some of the nerves that go from the spinal marrow to the lower limbs, so as to injure the actions of these last, as is evident from comparing the nineteenth anatomical table of Eustachius with his twenty-fifth table that shews the situation of the kidneys. But whether a complete palsy may ensue in the leg and thigh of the same side, from swelled kidneys, seems doubtful; since the large nervous trunks that are sent to those limbs go out from the foramina of the os sacrum, and are so situated that they can hardly be compressed by any tumour of the kidneys, however large. Therefore Aëtius ^c and Ægineta ^d have very well remarked the bad symptoms to be feared from a schirrhus of the kidneys, in the following passage: *Whatever schirrhosities or indurations are formed in the parts of the kidneys, they indeed no longer give the patients any pain, but a sort of apparent heaviness or pressure in the flank or space of the abdomen below the ribs: there is also a stupor in the thighs, and a debility or impotency of the legs: the patients also make little urine, while throughout the rest of their body they greatly resemble those who have the dropsy anasarca. Even some of these patients do in process of time run evidently into a true dropsy, in the same manner as that distemper arises from schirrhous indurations of the other viscera* ^e. For here we see, that not a complete palsy, only a numbness and impotency in the lower limbs, is mentioned. But that schirrhous indurations of the internal viscera do frequently

^c Serm. xi. cap. 17. p. 270.

^d Loco modo citato!

^e Quaecumque durities circa renes oboriantur, dolores quidam non amplius inferunt: aegris autem ex vacuo ventris loco veluti quidpiam pendere videtur: et stupor adest coxendicum, et impotentia crurum; minguntque pauca, et reliquo corporis habitu, aqua inter autem laborantibus, maxime similes existunt. Quidam etiam temporis progressu manifeste hydropem incurrunt, veluti etiam ab aliis visceribus induratis contingit.

quently give birth to a dropſy, will be hereafter ſhewn more at large when we come to that ſubject at §. 1229. But how difficult it is to cure ſchirrhi of the viſcera that are once formed, we ſhewed before when we treated upon this way of terminating a like inflammation of the lungs, pleura, liver, &c. Examples of ſchirrhouſe kidneys you may ſee in Bonetus *f*.

§. 1004. **I**F again, in this malady, a ſmall portion of the inflammatory matter coagulates, and lodges itſelf within one of the ſmall cells that are for the urinary ſecretion, it forms a point or baſis to which the tartareous or gravelly matter of the urine may cohere, and by repeated incruſtations form a growing ſtone of the kidney, which will again increaſe the nephritis: but of this ſtone we ſhall treat hereafter.

When we come to treat hereafter upon the Stone, it will be made to appear by incontestible experiments, that the urine even of the moſt healthy perſons is replenished with ſuch concreſcible matter as may form a ſtone, although they have no manner of prediſpoſition to that malady: which matter, though in a fluid ſtate, is however inclined to cohere with any contiguous body of a rough or unmucus'd ſurface. Now in the kidneys there ſeems to appear a number of minute cells ſubſervient to the urinary ſecretion; altho' there may be other ſecretory ducts likewiſe, leading directly from the arteries, without any ſuch interpoſed cells. It is true, the exiſtence of theſe cells is a point in diſpute among the moſt conſummate anatomists: but I have both ſeen ſuch preparations, and have ſome in my own poſſeſſion, as ſeem to plead ſtrongly for the exiſtence of ſuch cells in the kidneys; which is alſo a thing confirmed by ſome of the lateſt anatomical obſervations. If therefore a coagulum or inſoluble matter ſhall be lodged in the capacity of ſuch a cell thro' which the ſecreted urine continually flows, or becomes there

there more accumulated and arrested from the obstacle, it may insensibly grow up by repeated accretions of the said calculous matter that lurks invisibly in the urine, and by the same cause be greatly increased: for we often find stones, not only in the pelvis, but also in the very substance, of the kidney; and there are some observations that shew us such small gravelly portions have been found dispersed through the whole substance of the kidneys. Thus Schmid^a observed in the body of a man of consular dignity (who had been often troubled with nephritic pains, and at last died of a pulmonary consumption), that not only the tubes of the kidneys contained sand and gravel, but that the whole substance of the kidneys was replete with stony portions, insomuch “ that upon cutting thro’ the fleshy
“ body of the kidney, it seemed to be in divers parts
“ like cutting thro’ a heap of wet sand.” It is therefore apparent, that the inflammatory matter of a nephritis being unresolved may give birth to a stone in the kidney, since it may afford a basis upon which the stony matter that lurks in the urine may concrete, as we shall hereafter demonstrate more largely at §. 1414.

§. 1005. **B**UT a nephritis does also end sometimes in a gangrene, which we are taught to know from the violence of the causes (§. 994.), and of the symptoms (§. 995.); from the most suitable remedies (§. 997.) giving no relief; from a sudden remission of the pain, happening without any apparent cause; from the attendance of cold sweats; a weak, intermitting pulse; hiccups; urine either none, or such as is livid, black, fibrous, fetid, or discoloured with black or brown caruncles; and, lastly, a sudden and excessive weakness of all the powers of the body; but in this case, either the treatment
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^a Miscell. Curios. decur. 1. ann. 8. obs. 89. p. 149, 150.

of a gangrenous pleurisy (§. 902.) or nothing, will avail.

Concerning the change of an inflammation into a gangrene, and the signs by which it may be known, we before treated under the history of a Phlegmon, at §. 388. And in the histories of inflammatory maladies hitherto considered we have also expounded this fatal termination of a phlegmon, and explained the symptoms that attend such a change of it into a gangrene of the internal viscera. But these signs are either such as point out the future gangrene to be approaching, or those which shew it to be already present. The former are taken from the violence of the cause of the malady, and from the consequent symptoms; but the latter are taken chiefly from the sudden weakness of the powers, with an unexpected remission of the pain, concerning which see what has been said at §. 904. But the diagnosis of a present gangrene is confirmed when such matters are discharged from the affected parts as shew them to be in a mortifying state. For hence it is that we so much condemn a brown, muddy, filthy, black, and livid spitting, in a peripneumony (see §. 848.) and in a pleurisy (§. 901.) For the same reasons, muddy, green, black, and fetid or cadaverous stools, denotes that a gangrene attends in an hepatitis or inflamed liver (§. 949.) as also in an inflammatory iliac passion (§. 969.) And from hence likewise, in a nephritis, if there is no urine at all separated, it denotes an inflammation in the highest degree, and that the renal blood-vessels are so far stuffed up that there can be no further secretion of the urine. But while there is still some room for the urine to pass, or when the malady as yet lies only in one of the kidneys; in that case there will be a separation of urine by the sound kidney, but then there will be a discharge of putrid and gangrenous matter draining from the other affected kidney into the bladder, where, infecting the urine by its corrupt state, it will be discharged under the appearances described in our text. For that the substance of the kidney often dissolves into a

putrid gangrenous matter in those who perish of a violent nephritis, Eustachius^a learned from a dissection of these deceased bodies: and he even found a quantity of flatus within the outer membrane of the kidney that was yet entire, the spring of which flatus had removed the said membrane from the kidney into a considerable tumour. But it is well known that elastic air or flatus may be extricated by a putrefaction of the solid and fluid parts of our body.

What little room there is to hope for the patient's recovery when a gangrene has seized upon the viscera, we before declared at §. 432. But what treatment ought to be used in this worst state of the malady, may be seen at §. 902, 903, where we treated upon a gangrenous pleurisy. There it appeared that the gangrenous parts ought to be cauterised with deep eschars, since the only remaining hopes lie in procuring a discharge externally to the gangrenous putrefaction: and therefore if a tumour or livid discolouration appears here, in the back, over the region of the kidney, the same means ought to be put in practice, because by that the distemper will spontaneously gain a tendency outward. But even without this there remain some hopes in so desperate a malady, as there is an open passage left from the affected kidney by the pelvis and ureter into the bladder, by which the gangrenous ichor and dead sloughs may be carried off from the affected parts. For the whole curative intention in a gangrene (see §. 443.) is to procure a separation of the dead or gangrenous from the living parts, by a suppuration formed in those that are yet living, so as to leave a clean surface that may be afterwards consolidated. But to this end there must follow an entire separation of what is mortified, and a discharge of it, together with the corrupted matter, out of the body: and from hence it is that a gangrene of the viscera is deservedly esteemed so incurable; because, although a separation of their corrupted parts may be already begun, there is no way for the gangrenous matter and separated parts to come out of the body; whence there

ensues a most malignant putrefaction of the sound parts that are adjacent and watered by this gangrenous matter. But the kidneys have this advantage over the other viscera, that, if their gangrene stops without further spreading, we may hope for a discharge both of the matter and gangrenous parts cast off in the urine through the bladder, But since many observations inform us, that one kidney being wholly rendered useless, life may still subsist, and that even without any great disturbance, while the other kidney performs the office of the urinary secretion; it is therefore evident that a gangrene in the kidneys is more likely to be cured than in the other viscera, which, to continue life, are required to be entire. But yet patients seldom recover from a renal gangrene, because it is so apt to spread into other adjacent parts, as appeared in the body of Hildanus's son, who (as we before observed §. 995.) died of this distemper. Or if the gangrene spreads not, yet unless the matter falls down directly from the pelvis of the kidney, there is danger of its being absorbed by the veins, and of infecting the whole mass of blood with a fatal putrefaction (see §. 435.) Or lastly, tho' a separation should ensue of the dead from the living parts, and a discharge be made of them by the urine, still there is an ulcer of the kidney remaining from the gangrene, which (at §. 1002.) appears to be extremely difficult of cure.

§. 1006. **F**ROM what has been hitherto advanced, it is plain there are numberless kinds and causes of the distemper we call a Nephritis; and among these, one that arises from the stone or gravel: yet that all of them require almost the same treatment. We see from hence also, why a nephritis so frequently attends in fevers (§. 993.), and their crises (§. 996.) From thence likewise the nature and cure of an ischuria, from a fault in the kidneys or ureters, is understood.

If what has been said at §. 994. on the causes of a nephritis, be considered, it will plainly appear how numerous those causes are in this distemper, differing in their nature, properties, and seats. Accordingly we see various denominations have been given to this malady; since various writers have observed a nephritis inflammatory, suppurative, schirrhous, convulsive, gravelly, wormy, &c. Thus Tulp^a mentions, that a woman, who had been long afflicted with tormenting pains in the loins, discharged every day by urine five or six worms, of a white colour, and resembling maggots bred in cheese that has been corrupted. In another patient he saw hairs voided by urine, with great difficulty and disturbance of body, every fourteenth day; which were sometimes as long as one's finger, but generally half that length, covered with mucus, and so curled up that they came seldom unfolded, but generally convoluted in a globular figure^b. But, among all the causes of a nephritis, none is more frequent than a calculus or gravel, upon which we shall treat professedly hereafter: but then a calculus produces a nephritis not otherwise than by the weight and roughness of its parts irritating whatever it touches; for there are numerous observations which inform, that, in opening and embalming the bodies of great persons, stones have been found in the kidneys, although they were never troubled with a nephritis. An eminent physician^c, after a tertian fever, voided twenty-one small worms by urine, without any pain or strangury, and the worms were living: whence it follows, that neither do these always produce a nephritis, unless by their motion or gnawing they irritate the parts wherein they are lodged.

Yet there is no great difference in the treatment or cure of the nephritis, although it is observed to arise from such a variety of causes; for those do not, properly speaking, produce a nephritis until they have excited an inflammation. And therefore the cure will always consist in resolving or dispersing the inflammation,

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tion,

^a Observ. Medic. lib. ii. cap. 51. p. 179.
p. 180.

^c Ibid. cap. 50. p. 178.

^b Ibid. cap. 52.

tion, and in trying to remove or expel the irritating cause that produced the malady. For whether a nephritis arises from a stone in the kidneys, or from another cause irritating to an inflammation, it will require the same treatment. It is true indeed, that blood-letting does not directly act upon the stone lodged in the kidneys; but then, by a depletion of the vessels, the inflamed parts subside, which by their swelling hindered the stone in its descent to the bladder. This has been fairly remarked by Aretæus, when he recommends blood-letting where an inflammation arises from a stone in the kidney: *For not only inflammations are abated by evacuation, but also impactions of the stone are relaxed or set free from arrestment by emptying of the vessels*^d. And elsewhere he recommends blood-letting to promote a discharge of the stone: but he also gives a just reason for it, when he says, *For a phlegmon keeps all the parts strained or bound up together; but evacuation resolves a phlegmon*^e. Sydenham^f has observed, that sometimes a most severe pain arises about one or other of the kidneys in hysterical patients, so as perfectly to resemble the fit of a nephritis or gravel, from which it can only be distinguished by those who are well versed in practice. In this case, there is merely a cramp or spasm of the kidney, without any inflammation, or any irritation from a stone; and therefore it requires another sort of treatment. But hysterical complaints are to be distinguished by their proper signs, and commonly yield easily to antihysterical medicines, especially with a few drops of laudanum. But if such cramps continue long, they may produce an inflammation of the kidneys, as was said before at §. 994, n^o 4. From whence it then appears to require the same method of cure.

Why in fevers, &c.] It was before made apparent in acute or inflammatory diseases, that the matter of the

^d Neque enim phlegmonæ tantum evacuatione mitigantur, sed etiam calculorum incuneationes (σφηνώσεις των λιθων) vasorum inanitione laxantur. *De Curatione Morbor. Acutor. lib. ii. cap. 8. p. 109.*

^e Phlegmone enim colligata tenet omnia: evacuatio autem solutio est phlegmones. *Ibid. cap. 3. p. 10.*

^f In Dissertat. Epistolar. ad Gulielm. Cole, p. 489.

the distemper being subdued and rendered moveable, goes out by the urinary passages, and therefore must pass through the kidneys. But since this morbid matter has such conditions as will not allow it to move through the vessels with the other humours, without disturbing the equable circulation; therefore it is no wonder if it lodges itself for some time in the straits of the vessels of the kidneys; or else, irritating those vessels by a greater acrimony, may thus excite a nephritis, but such generally as is slight and soon goes off when the said matter is discharged in the urine. For since such a urine that is critical often occasions a strangury when it is evacuated (see §. 888, n^o 2. and 923, n^o 2.), nobody will wonder if it also gives an uneasiness to the kidneys. But in other distempers it is observed, that the morbid matter will sometimes cause a slight inflammation in passing thro' the viscera, before it is deposited by a translocation upon any certain part of the body. Thus in a peripneumony (see §. 839.) the signs of a slight inflammation in the hypochondria denote that critical abscesses may be expected about the legs. But such pains about the kidneys as attend while the matter of the distemper seeks a way by the urine, seem to have been also observed by Hippocrates, where he says, *In a pain of the hypochondria with a murmuring, and a pain of the loins superadded, in fevers, the bowels commonly grow loose, unless a flatus breaks forth, or a copious urine is discharged*^g. And in another place he has observed^h, that atra-bilis sometimes flows to the kidneys; and that then the urine is discharged like the water in which flesh has been boiled; and that even the kidney becomes ulcerated, if the atra-bilis does not flow thro', but stops in the kidney.

From thence also the nature and cure of an ischuria, &c.] An ischuria or suppression of urine is commonly distinguished into two kinds: one in which

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there

^g In dolore hypochondriorum submurmuranti, lumborum dolor superaddens in febris, ventres ut plurimum humectat, nisi flatus eruperit, aut urinæ copia prodierit. *Côac. Prenot. n^o 292. Charter. Tom. VIII. p. 869.*

^h De Internis Affectionibus, cap. 17. Charter. Tom. VII. p. 650.

there is no urine sent into the bladder; the other wherein the bladder discharges not the urine which it contains. The first is known when there is no sense of tightness perceived about the pubes, nor any apparent tumour or distension of the bladder found in the hypogastrium, but most certainly of all when by passing the catheter there is no urine discharged from it. Such an ischuria then follows from the action of the kidneys hindered, by which means they separate no urine from the blood, although the passages through the ureters be free enough; of which case an example is given at §. 995. The same suppression may also arise when, the secretory action of the kidney being duly performed, the passage through the ureters to the bladder is stopped by a stone, congealed blood, thick mucus, or the like, by which the separated urine is hindered from going into the bladder. But from what has been hitherto advanced, the cure of such an ischuria is sufficiently intelligible; more especially if those particulars are also considered which we shall hereafter propose in the chapter upon the Stone.

Of the APOPLEXY.

§. 1007. **T**HE great acuteness of the apoplexy, its frequent connection with inflammation, and being productive of a great many disorders depending thereon, naturally lead us to treat next of that disease.

This disease is called *αποπληξια, αποπληξις, αποπληκτικον νοσημα*, receiving its name *απο τη αποπληξιν*, which signifies to *strike*, and sometimes likewise to be *frightened, surprised, thunder-struck*. Whence Celsus^a calls those who are seized with this disease *thunder-struck*. Perhaps those who are taken with a catalepsy might more properly be called thunder-struck, as in that the patients remain like statues, in the same posture which they were in

^a Lib. iii. cap. 26. p. 177.

in when they were first seized, as will appear in the next chapter. But persons seized with the apoplexy fall down at once, as if struck by a sudden blow; in the same manner as a bullock, knocked down by the butcher's hammer, falls to the ground snoring, and downright apoplectic. Whence it seems more proper to derive the etymology of this disease from *striking*; and therefore in the German idiom, as well as in other languages, it has its name from a blow. Thus likewise we read in Eutropius^b, that Verus Antoninus sitting with his brother in a vehicle, died, *subito sanguine ictus, casu morbi, quem Græci αποπληξιν vocant*; "overwhelmed with a sudden torrent of blood, in the disease which the Greeks call an apoplexy."

But Celsus seems to have described two distinct diseases under the same Greek name *αποπληξιας*. The first he^c calls *attonitus*, in which both body and mind are rendered stupid; and this he says but rarely happens. The other he calls *resolutio nervorum* *παρалуσις*; a disease frequent every where. And he adds, that when a palsy affected the whole body, the ancients called it an *apoplexy*; if some parts only, a *palsy*. He likewise observes, that in his time both these diseases went by the name of *palsy*; and indeed the apoplexy is an universal palsy. Hence likewise it is more probable, that by the name of *morbus attonitus* Celsus understood the catalepsy, which occurs much more seldom than the apoplexy.

But I thought it more proper to treat first of this disease, since with the greatest quickness, as of the most acute disease whatever, it so frequently hurries off the patient; and because it frequently enough happens, that inflammatory diseases terminate in a fatal apoplexy; as in the true phrenitis, and other acute diseases, when the morbid matter is determined to the head by an unlucky metastasis. Besides, it is necessary to be acquainted with the history of an apoplexy, before we can treat of the palsy, epilepsy, catalepsy, and carus; because these diseases frequently follow an apoplexy; as indeed sometimes they precede it;

^b Lib. viii. sect. 22.^c Lib. iii. cap. 26.

it; and frequently they are produced from very similar causes.

§. 1008. **A**N apoplexy then is said to be present, when of a sudden all the senses and voluntary motions are abolished, the pulse in the mean time remaining for the most part strong, the respiration difficult, high, and snoring, together with the appearances of a profound and continual sleep.

We come now to treat of the adequate definition of this disease; and at the same time it will appear what are the symptoms which shew the disease to be present, and likewise those which distinguish it from other diseases. But here we treat of the true *apoplexy* properly so called: For we shall see that persons have been said by several authors to die of an apoplexy, who have indeed died suddenly; for example of a fatal syncope, owing to a polypus suddenly propelled from the heart into the larger arteries, or a rupture of the great vessels near the heart, &c.; but it is certain, nevertheless, that they were not apoplectic. For although the apoplexy frequently terminates in death; yet, to constitute that disease, all the animal-functions ought to be abolished before death, while the vital ones still remaining are sometimes augmented, as will appear, §. 1014.

Galen in his medical definitions describes an apoplexy as follows: *An apoplexy is an unconsciousness of the mind, with a privation of the senses, and a palsy of the body: also an apoplexy is a privation of sense and motion in all the nerves*^a. And Aretæus has it thus: *An apoplexy is a palsy of the whole body, sense, mind, and motion*^b. But it is plain that by this definition an apoplexy

^a Apoplexia est detentio mentis, cum abolitione sensuum, et corporis resolutione: Item apoplexia abolitio est in nervis omnibus sensus et motus. *Defin. Medic. n^o 244 Charter. Tom. II. p. 261.*

^b Apoplexia totius quidem corporis, et sensus, et mentis, et motionis, resolutio est. *De Causis et Signis Morbor. Diuturnor. lib. i. cap. 7. p. 33.*

plexy is not distinguished from a syncope, in which all the senses and motions are likewise abolished. Aretæus seems to have been sensible of this objection; for, in the same chapter, to the definition of the apoplexy he subjoins the lipothymia, which he describes thus: *A palsy of the knees, and a stupefaction of the senses for some time, a fainting, and falling suddenly down, we call a lipothymia^c.* From which it appears, that Aretæus distinguished the apoplexy from a deliquium chiefly from thence, that the (*πρὸς καιρὸν νάρκη*), *the stupefaction not remaining long*, was the case in a deliquium, whereas in the apoplexy that symptom continued. It is indeed very true, that, in a deliquium, the patient frequently comes to himself again very soon: but we have likewise examples of persons sometimes remaining a long while in a perfect syncope; nay, they have even been reckoned dead, and afterwards recovered. Wherefore even thus this difficulty, arising from the above definition of the apoplexy, is not entirely removed. But the definition in the text is better and more adequate, *viz.* that in the apoplexy all the animal functions are suddenly abolished, while the vital ones remain: for thus the apoplexy is perfectly distinguished from a syncope and deliquium. Hence Ægineta^d in his description of this disease, very well adds, That respiration remains in the apoplexy; and that it is the very worst sign if it intermits or is laborious; as we shall see in apoplectic persons, that, when they are a-dying, respiration is performed with violent snoring and motion of the breast. It appears likewise from what has been said, why Archigenes writing upon this disease says, “Those who fall into this disease, live as if they were dead, void of all sense^e.” For it evidently appears, that by this he wanted to shew, that though the senses were abolished, yet the vital functions still remained in this disease.

In the mean time it appears, that Hippocrates sometimes

^c Genuum resolutionem, et sensus per aliquod tempus stuporem, et exanimationem, et casum, lipothymiam vocamus. *Ibidem.*

^d Lib. iii. cap. 18. p. 31. ^e Aetius, lib. vi. cap. 27. p. 253, 254.

times understood by the word *apoplexy*, a palsy of a particular part of the body, as it is observed by Aretæus and Ægineta^f; for he has applied the word *apoplectic* to the leg. The celebrated Wiggan^g, who has published a very beautiful and correct edition of Aretæus, in his learned notes upon the various readings, observes that after a long and repeated search he could not find in Hippocrates *Ἀποπληκτον σκελεθ*. But, however, there are several places in Hippocrates^h, where the apoplexy is evidently taken for a palsy of a particular part.

It appears from what has been said, that a diagnostic may be had sufficiently certain, by which the apoplexy may be distinguished from other diseases. But it is more difficult to distinguish it from a profound sleep, which it very much resembles, and in which all the senses and voluntary motions are abolished. It is true indeed, that a man, though he be buried as it were in a profound sleep, for the most part may be roused by such things as affect the organs of sense very strongly; but this cannot be done in the apoplexy. Nevertheless, sometimes men exhausted by labour, and especially by long watching, are so oppressed with a profound sleep, that the loudest noise is not capable of rousing them; nay, even the pain of burning cannot awaken them. I knew a very valiant warrior who in a town that was besieged had not slept for eight and forty hours; at last, wrapping himself up in his cloak, he lay down upon the ground, between two large cannon, which were firing continually: yet neither the noise of the soldiers, nor the terrible and almost continual roaring of the cannon, were able to rouse him from a very pleasant sleep, which he enjoyed for ten hours. I have seen some cases where vessels full of boiling water have been put under the bed clothes, to defend persons from the violent coldness of the weather, that their legs have been miserably burnt without the pain's having awaked them, being bu

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^f Locis modo citatis. ^g Aretæi p. 493. ^h Aphor. 40. sect. vii. Charter. Tom. IX. p. 312. Prorrheticor. lib. ii. cap. 10. Charter Tom. VIII. p. 819. Coac. Prænot. n^o 359. *ibid.* p. 872. et n^o 477 *ibid.* p. 879.

ried in so sound a sleep. It is true, that persons in health awake spontaneously from the most profound sleep, while apoplectic persons keep constantly sleeping. But here the question is, how to distinguish a person in a very sound sleep from one who is apoplectic, while he snores in the same manner, and cannot be roused by such powerful causes affecting the senses? This holds still more true in drunken persons: and Hippocrates, seems to acknowledge this difficulty, when he says, in a place before quoted upon another occasion, §. 558. “ If a drunken person suddenly loses
 “ his speech, he dies convulsed, unless he should be
 “ taken with a fever, or recover his speech as soon as
 “ his drunken fit is overⁱ, Where it appears, that he defers the certainty of the prognostic, till the time when the drunken fit is over. But Galen^k remarks in his commentaries upon this passage, that it was usual enough for Hippocrates to call those persons drunk, who were deprived of sense and motion over the whole body, and so to give a name to a disease from one single symptom. But a very sound sleep in drunken persons is so much the harder to be distinguished from an apoplexy, because it appears from numerous observations, that a great degree of drunkenness has frequently enough terminated in a fatal apoplexy. There still therefore remains a great difficulty, how to distinguish by certain signs a very sound sleep in a person in health from an apoplexy: but if we know that it has been preceded by tedious watching, very great fatigue, or too plentiful drinking, we may be the more assured that the sleep is natural, and not apoplectic. In apoplectic persons, likewise, the face is usually more red and puffed up, and the respiration for the most part more laborious, than in persons who are in health when they sleep.

§. 1009. **T**HE most accurate and repeated observation teaches, that an apoplexy has been produced, as often as such causes have

ⁱ Aphor. 5. sect. v. Charter. Tom. IX. p. 196.

^k Ibidem.

have preceded as are able to hinder entirely, or in a considerable degree, the afflux of the animal spirits secreted in the brain to the organs of sense and voluntary motion, and (*vice versa*) the reflux from these organs to the common sensory; the passage of the spirits of the cerebellum to the heart and natural organs of respiration still remaining free, and perhaps their return in some measure sufficient to support these functions for some time.

If we consider what is demonstrated in physiology^a concerning the use and function of the brain, it will appear sufficiently evident, that, in order to the proper exercise of the senses and voluntary motions in us, there must be a free course of a very subtle fluid from the brain through the nerves to the organs of sense and the muscles, so that the cause of muscular motion may be communicated to them, and the change made by sensible objects on the extremity of the nerves destined for sensation may be propagated to the common sensory. But as in the apoplexy all the senses and voluntary motions cease, whatever is able to hinder a free passage from the brain through the nerves to the muscles subject to the command of the will, and to the organs of the senses, will be a sufficient cause for producing an apoplexy. Whence Ægineta has beautifully described this disease thus: *The common origin of the nerves being affected, and thereby all the parts of the body losing their sense and motion, the disease is called an apoplexy*^b. But that common origin of the nerves is now usually called by physicians the *common sensory*; by which name is understood that part of the body, from whence all the nerves, destined for the senses and voluntary motions, derive their origin.

Although in the apoplexy the voluntary motions cease, and the organs of the senses do not perform their

^a H. Boerhaave Instit. Medic. sect. 284.

^b Communi nervorum principio affecto, et inde omnibus corporis partibus pendentibus motum simul et sensum, apoplexia morbus vocatur. Lib. iii. cap. 18. p. 31.

their functions, yet there still remain several motions in the body. The action of the heart and arteries continues, as also the several secretions of saliva, mucus, urine, &c. depending thereon. Respiration likewise goes on, as also the peristaltic motion of the intestines. But all these actions are carried on in the body without our being conscious of them, as is very well known; neither has the will any direct command over them, so as to increase, diminish, stop, or moderate them, &c. Whence the most intelligent physicians have justly concluded, that these motions which are called vital and spontaneous, have a different source from the former, which we are conscious of performing, and are plainly subject to the power of the will.

But seeing it has appeared from numerous observations, that in persons who have been wounded (upon which see what we have said in the history of Wounds of the Head), the brain being considerably hurt, or compressed, the exercise of the senses and voluntary motions have been disturbed and abolished, life still remaining, as also the several motions which are performed without our being conscious of them; so physicians have concluded that the common origin of the nerves destined for the senses and voluntary motions, or the common sensory, has its seat in the brain. For, as Galen has very ingenuously remarked, in the organs of sense a change is indeed made by sensible objects; but the perception of that change is not made in these organs, but in the brain: whence he says, *Ipsum namque cerebrum sensorium organum a natura factum non est, sed sensoriorum sensorium*; “For the brain itself is not made by nature an organ of sense, but the sensory of these organs^b.”

Further, it appears from the same observations, that the common sensory is sooner hurt, and more easily destroyed, than the other part of the brain (whichever that is) upon which the vital and spontaneous motions depend. For in violent hurts of the head by contusions, wounds, &c. persons frequently lie apoplectic several days before they die; a large dose of c-

pium, or drinking too plentifully of generous wine, overpower for some time all the animal functions, while the vital and spontaneous ones persist and increase. Besides, even health requires a daily rest or cessation for some hours from sense and voluntary motion, the vital functions being at the same time increased during our natural sleep. But the cerebellum, which is less in bulk than the brain, and of a firmer texture, by its situation, and the expansion of the dura mater, being more safely defended against the force of external causes than the brain, was believed to be that part of the body whose soundness was requisite in order to these vital and spontaneous motions being continued without intermission. Experiments made upon living animals (see §. 170, n^o 1.) seemed also to evince the truth of this opinion. Wherefore it was concluded, not without reason, that, in the apoplexy, the afflux of the spirituous liquid of the brain into the organs of sense and voluntary motion must either be entirely or very much hindered, while the course of the liquid of the cerebellum to the heart and natural organs of respiration still remained free, and perhaps in some measure their return likewise.

But observations and experiments, which have since been made by men of reputation and veracity, seem to shew, that the cerebellum may be considerably hurt, and life not only remain, but the vital actions be not much impaired. In a youth, who died the fourteenth day of an acute disease, there was found a large abscess in the right lobe of the cerebellum, which had consumed two thirds of its substance: yet the pulse and respiration were good enough, during the disease; but he was seized with a palsy of his right side before he died^d. More observations of the same kind made on bodies that were dissected, and experiments on living animals, may be seen in the celebrated Senac^e, teaching us, that the origin of vital motions cannot be ascribed to the cerebellum alone.

§. 1010.

^d Nouvelle Literarie 20. Marzo 1750, n^o 12. p. 179. ^e Traite de
 1 structure de Cœur, Tom. I. liv. III. chap. 7. p. 428, &c.

§. 1010. **A**LL which causes reckoned up by observators may be reduced to a few classes for the use of practice.

I. The natural make of the body. The head large; the neck short, and frequently consisting only of six vertebræ; the body very gross and fat; the constitution plethoric; a cacochymia remarkably phlegmatic.

As it is evidently proved in physiology, that, in order to the functions which depend upon the brain remaining perfect, there is required a sufficient quantity of sound liquid to be moved on through its vessels by a determinate force, that thence there may be secreted a very subtle fluid, to be sent by the nerves to the organs of the senses and the instruments of motion; it appears plain enough, that there may be a great number of causes sufficient entirely to prevent, or very much to obstruct, the secretion of this fluid, and its free motion through the nervous fibres, and so produce an apoplexy. For whatever compresses the vessels, or dissolves their cohesion; all faults of the humours, by which they degenerate from a sound state into various morbid disorders; the quantity and momentum of the humours either too much increased or diminished; may all give origin to this disease; and therefore they deserve to be reduced into certain classes, that they may be examined in order, and assist in pointing out the indication of cure.

[The head large, &c.] Every body knows what a difference there is of the size of the body in different persons: but it is observed, that diversity of stature is chiefly owing to the different length of the legs and thighs, and also of the neck; for the trunk of the body is frequently of the same length in two men, one of whom is upwards of a foot taller than the other. But the longer the neck is, the greater is the distance of the heart from the basis of the skull. But as the motion communicated to the blood by the contraction

of the heart, and the dilatation of the arteries occasioned by the blood which is propelled through them, are stronger near the heart, than in parts more remote from it; it is thence very plain, that the nearer the heart is situated to the head, the blood will be pushed with the greater force through the vessels of the brain, whence likewise these vessels will be the more distended; especially as the blood is sent to the head in a straight course through pretty large arteries. Hence it is remarked in physiology ^a, that the carotid and vertebral arteries, when they approach the basis of the brain, are disposed in such a manner, as that the force of the blood which is propelled through them may be diminished, lest the soft substance of the brain should be hurt by its violence. Whence it appears, why a short neck is justly reckoned a predisponent cause of the apoplexy: and daily observations confirm to us, that such persons are frequently subject to this disease; and for the same reason we almost always see, that in them the face is more red and puffed up. Hence likewise such persons seem to have a large head; though frequently it is only in appearance, owing to the face being swelled and inflated, seeing the largeness of the head properly depends on the capacity of the skull, and a large and capacious skull, especially towards the hinder part, is deservedly reckoned among the signs of a good habit, and a symptom of longevity ^b.

The body very gross and fat.] It appears from physiology, that, by the conjunct action of all the chylopoietic viscera, every thing in the aliments that can be dissolved is extracted in a sound person, the solid parts being sent off by stool. But while this is doing, the oil of the aliments is separated from the other parts, and constitutes a fat chyle, which flowing through the vessels together with the blood, and being thence separated from it by the particular structure of the breasts, is called *milk*, which spontaneously yields a fat cream upon standing some time in a vessel after it has been milked. But that plentiful fat oil lies wonder-

^a H. Boerhaave Instit. Medic. sect. 235. ^b Ibid. sect. 885. n^o 5.

derfully concealed, while, being united with other particles, especially saline, it forms a kind of soap, as happens in all vegetables juices. From grass, which seems to be so void of oil, and water, the cow daily produces milk, which yields a great quantity of fat butter; whence that fat substance is extracted from the grass in this animal by chylicification, which at first view no body would easily believe to be contained there in so great a quantity. But when that fat oil remains in the body, either in an ox, or a cow that does not give milk, these animals in a few months grow surprisingly fat, provided they have a good pasture, and are not fatigued with labour. The same thing happens in the human body: and by chylicification that fat oil is separated from the aliments, for the most useful purposes. For it is very well known, that the cellular membrane, in which that oil is collected, is spread over all the muscles, nay sheaths every single fibre of them, in order to preserve them easily moveable, and sufficiently flexible: so likewise the fat marrow deposited in the cavities of the larger bones conduces to the mobility of the joints, and preserves the ligaments (connecting the articulated bones) sufficiently flexible. Wherefore the fat is of great use in facilitating muscular motions; and, being agitated and attenuated by the action of the muscles, it is taken up afresh into the veins, where, mixing with the circulating humours, it is expelled out of the body together with the sweat and urine, as appears from certain experiments. Persons who get their livelihood by strong labour, have their clothes rendered stiff with a greasy fat sweat, and their urine is very red; neither do they easily grow fat, although they eat very heartily. But when strong chylopoietic viscera separate this oil in great plenty from the aliments, and it is not dissipated by the exercise of the body, then it begins to be accumulated, to distend the cellular membrane, and frequently to increase it to a prodigious bulk. The skin indeed yields by degrees, and is removed from the subjacent muscles: but nevertheless it still makes a resistance; whence all the subjacent parts are compressed, and the vessels

straitened by the accumulated fat. Hence physicians observe the pulse to be not so strong in fat persons; and surgeons find it a very difficult task to bleed them, not only because the veins lie buried beneath the thick fat, but likewise because they are smaller. If at the same time we consider, that the omentum in fat persons is frequently distended to a great bulk with fat, and all the abdominal viscera are thereby compressed, it will appear very evident, that the passage of the blood through the descending aorta and its branches must be rendered less free. Nor indeed ought this compression of the too fat omentum, whereby it affects the neighbouring parts, to be deemed inconsiderable, seeing Hippocrates has deduced even barrenness itself in women from this cause: “ But if a woman grows pre-
 “ ternaturally fat, she does not conceive; for the
 “ womb is compressed by the superincumbent di-
 “ stended omentum, whereby conception is prevent-
 “ ed.” He has the same observation in his aphorisms^d; and there he adds, that such fat women never become pregnant, unless they are first rendered leaner.

Seeing therefore, in persons who are very corpulent, all the vessels of the body are compressed by the accumulated fat; and there is no fat observed within the skull, or at least very rarely, and a very small quantity about the sinuses of the dura mater; it appears very plain, that thereby the larger vessels of the brain must be filled and dilated, and the smaller ones compressed, whereby its functions will be gradually more and more obstructed: hence they begin to grow dull, torpid, forgetful, and sleepy; all the senses are rendered less acute in them; and at last, the brain being oppressed with too great fullness, or a bursting of the vessels, they die apoplectic. Thus Justin relates of Ptolemy, king of Egypt, “ That he became so stupid with in-
 “ dolence and luxury, that he not only neglected the
 “ offices of a king, but likewise by his too great cor-
 “ pulence he lost even common judgment.” It is a
 still

^c De Natura Muliebri, cap. 19. Charter. Tom. VII. p. 690.

^d Aphor 46. sect. v. Charter. Tom. IX. ibid. p. 222.

Philipp. lib. xxxiv. cap. 11. p. 621.

^e Hist.

still more surprising account which we read in Varro of a sow, "which was so very fat, that she was not only unable to rise, but likewise that a rat eat a hole in her body, in which it nestled and brought forth its young f." The most dangerous case of all is, when that quantity of fat in very corpulent persons, being dissolved and attenuated by sudden heat, violent exercise, or a fever, enters the veins, and is mixed with the blood, whereby the quantity of circulating humours is suddenly increased, and, the vessels bursting with the quick and violent repletion, an apoplexy frequently follows, which soon proves mortal. Hence Hippocrates observes, "That such persons as are naturally very corpulent die more suddenly than those who are lean g;" as we remarked on another occasion in the comment to §. 693. treating of the feverish heat being suddenly increased from the bulk of the bodies to be moved.

A plethoric constitution.] Where there is too great a quantity of red blood in a body otherwise healthy, then it is called a *plethora*, (see §. 106. a.). But tho' all the functions of the body may be hurt by a plethora, yet it is observed to hurt those chiefly which depend upon the brain: for plethoric persons become sleepy, torpid, and subject to swimings in the head; and unless that redundance of the blood is diminished either by natural or artificial evacuations, there will be danger of an apoplexy. The reason seems to be this: The red blood naturally is not found in the vessels of the brain, but in those of the pia mater, and in all its processes, which insinuate themselves every where between the cortex and medullary substance of the brain; as therefore all the blood-vessels in plethoric persons are turgid with too much blood, these vessels likewise will be distended: but the cavity of the skull is very exactly filled up by the contained brain, and the bones of the cranium cannot yield in adults; wherefore, the blood-vessels being more full than usual, the other vessels, which contain the thinner fluids,

f De re rustica, lib. ii. cap. 4. p. 286.
Charter. Tom. IX. p. 83.

g Aphor. 44. sect. ii.

fluids, must be straitened and compressed, and therefore the functions of the brain disturbed, as was likewise remarked upon another occasion in the comment to §. 112, n^o 1. But all these symptoms are increased, if by too plentiful eating, or drinking too large a quantity of generous wine, a sudden fit of passion, very hot weather, or violent exercise, the blood in plethoric persons suddenly rarefies, and over-distends the vessels. Hence it has so often been observed, that persons of this habit of body have fallen down apoplectic, in the middle of their feasting, or in a violent of anger.

A cacochymia remarkably phlegmatic.] As the secretion of that very subtle fluid which moves through the nerves is made from the arterial blood conveyed to the brain by the carotid and vertebral arteries, it is requisite, in order to that fluid's being sufficiently subtilized, that the blood have all the properties which are peculiar to it in a sound state. But in a phlegmatic cacochymia the blood degenerates from that quality which it possesses in health, and is rendered less fit for the secretion of the nervous fluid by means of the mechanism of the brain; whence we likewise see, that those persons who labour under such a cacochymy are torpid, and perform muscular motion with difficulty. In the mean time, however, they lead that languid and indolent life a long while; nor does an apoplexy so soon follow in them, as in those who are fat and plethoric. Whence it is added in the text, "remarkably phlegmatic:" viz. when that phlegmatic lentor of the blood is increased to such a pitch, that it begins to be obstructed in the vessels of the brain; and thus the secretion of the spirits is either entirely hindered, or at least almost so. But of this species of cacochymy some things remain still to be said in the following number.

II. Whatever causes change the blood, lymph, and thinner humours, from which the animal-spirits are secreted, in such a manner, that they can-

cannot pass freely through the arteries of the brain, but remain intercepted: such are frequently, 1. Polypous concretions in the carotid and vertebral arteries, formed either near the heart especially, or within the skull itself: which discover themselves by palpitations of the heart, an unequal pulse, swimming in the head, and dimness of sight, which frequently return, and are increased by violent motion and heat. 2. Air inflammatory thickness of the blood: which shews itself by an acute continual fever, frenzy, and a violent inflammatory pain in the head, having long preceded; and likewise by all the symptoms, arising from the blood, which, being hindered to flow through the vessels of the brain, rushes in greater quantity and with a stronger force thro' the other branches of the carotid, whence a redness, swelling, and inflammation of the eyes, with a discharge of tears, and the same appearance of the face and neck. 3. A thick, glutinous, pituitous disposition of the whole mass of blood: whence this disease is very incident to old, phlegmatic, cold, moist, pale, leucophlegmatic persons; nay, it may even be foretold to such before it happens, by their laziness, stupidity, sleepiness, aversion to any motion whatever, the voice slower than usual, tremblings, snoring, incubus, the eyes languid, turgid, moist and dim, a frequent vomiting of phlegm, swimings of the head, difficult breathing after the least motion, with the alæ of the nose compressed; in short, by all the causes which produce, and accumulate, an inert phlegm, (§. 69. to 75.).

In this number those causes are reckoned up which produce an apoplexy by a fault of the humours not being able to pass freely through the vessels of the brain.

Now

Now observations teach us, that too great thicknefs of the humours may be reduced to three species, *viz.* to polypous concretions, an inflammatory thicknefs, and a phlegmatic lentor. To each of these are subjoined the diagnostic figns, by which they may be distinguished from each other, which is chiefly of service in directing to a proper method of cure.

1.] These polypous concretions of the blood, with their causes and origin, were treated of before in the comment to §. 52.; and then it appeared, that they were chiefly found in the heart and the large vessels near it. It was proved from several observations, that those polypi sometimes grew to the fleshy pillars of the heart; and afterwards happen to be separated from thence, and be propelled together with the blood into the pulmonary artery, or the aorta, and its larger branches, so as either to straiten them very much, or entirely stop them up. I have thrice seen in bodies that were dissected such branched polypi, which sent forth productions to the trunk of the aorta and its superior branches: I own indeed they were very soft, and perhaps were only formed about the time of death, or even after it. But it appears from what was said in the comment to §. 52. that such branched concretions may likewise be formed during the person's life; and if they happen to stick in the carotid and vertebral arteries, they must disturb the functions of the brain, and entirely abolish them, if they altogether intercept the passage of the arterial blood to that organ. There is a practical observation in Peter Salius Diversus^a, which seems to confirm this. A girl of fourteen years of age, after complaining a whole day of a heaviness of her head, anxieties, and giddiness, died suddenly the day following: upon dissecting her, there was nothing preternatural discovered in the brain; but in the great artery, and vena cava, the blood was so coagulated, “that, catching hold of one
“end of the concreted mass, the whole coagulation
“was pulled out as entire as a sword is drawn out of
“a scabbard.” For in this case the hurt communi-

cated

^a De Febre Pestilenti, et Affectib. Partic. &c. cap. 4. p. 238.

cated to the functions of the brain before death seems to have been owing to the polypous concretion hindering the free passage of the blood to that part. But as the carotid arteries are united under the basis of the brain with the vertebrales, and with one another, by anastomosing branches, therefore the passage of the blood to the brain cannot be entirely prevented, unless all these four arteries are obstructed at the same time with such polypous masses; so it is plain, that an apoplexy can seldom happen from such a cause: for one or other of these arteries being thus obstructed, and rendered impervious, the functions of the brain will thereby indeed be disturbed, but not entirely abolished, as happens in a true apoplexy. But if a polypus should so obstruct the aorta as to hinder the passage of the blood to those branches which it sends off upwards from its curvature immediately after it rises from the heart, a sudden death from a fatal syncope would rather be thereby produced, than an apoplexy; unless such a polypous mass should stick in the upper part of the curvature of the aorta, and so hinder the entry of the blood into its superior branches; while in the mean time, not occupying the whole cavity of the aorta, it should still leave some room for the blood to pass by the trunk of that artery to the lower parts of the body. But it easily appears how rarely such a case can possibly happen. Neither do I believe that it can be proved from certain authority, that such polypi have been formed in the arteries of the brain within the skull as are able to hinder entirely the motion of the blood.

But we know polypi to be sticking in the cavity of the heart, or in the large vessels near it, from the perpetual palpitation of the heart, and the pulse being very unequal and frequently intermitting, owing to the obstruction which the blood meets with upon its entry into the heart, or its expulsion out of it, whence its action and the pulse must necessarily be disturbed. This diagnostic is confirmed, if all these symptoms are increased by exercise, or by rarefaction of the blood from heat: for while the blood is moved only gently
through

through the vessels, it passes by these obstacles without any great difficulty; but if its celerity be increased, or if it be rarefied, there is not sufficient space left for it in the cavity of the heart or blood-vessels, so as to allow it to circulate freely. I have seen wretched patients of this kind, who while they continued altogether quiet were tolerably easy; but if they attempted to raise themselves up or turn themselves in bed, they were immediately seized with a violent anxiety, and sometimes fainted away. Thus likewise palpitations of the heart, and an unequal pulse, produced from polypi, may easily be distinguished from the like complaints, which are frequently observed to happen in hysterical women from any disturbance of the mind: for in them, as soon as the said commotions are quieted, all the above symptoms presently cease, neither are they roused again from the increased motion of the body after they have been once quieted.

If, together with these signs of a polypus, there is joined a swimming of the head, or a seeming rotation of all objects, which is the first and slightest degree of a vertigo; or a scotomia, when, the disease increasing, together with the seeming rotation of objects, the sight becomes dim, as if the person was immured in darkness; then we know, that the polypous obstacle hinders the free motion of the blood through the arteries towards the brain. For, as I have remarked elsewhere, (see §. 267.) almost all the diseases of the head begin with a vertigo; and when they are cured, this symptom remains the last.

2.] Every body knows, that sound blood has a spontaneous tendency to concretion; and that that concretion is prevented by its continual motion through the blood-vessels. But we find the blood a great deal thicker, and disposed to concrete more firmly, in strong robust persons, especially if they lead a laborious life. When therefore this thickness of the blood is so far increased, as to prevent it from passing easily through the smallest arterial branches, or to stop its course, then it is called an *inflammatory thickness*. But this thickness of the blood is attended with a greater heat,

as we explained more at large in the chapter upon Inflammation; and thus it is distinguished from a phlegmatic cold lentor of the blood, of which we shall treat in the following number. When therefore such inflammatory blood begins to stick in the vessels of the brain, all the effects of inflammation follow, *viz.* acute fever, troublesome pain, &c. But that pain of the head seems chiefly owing to the membranes being inflamed, seeing the cortex of the brain hardly appears to be sensible of much pain, (see §. 772.) However, in this case, the functions of the brain are very much disturbed, and a furious perpetual delirium is produced, attended with an acute fever; as was observed in the history of a Frenzy. This disease increasing, the vessels, distended and swelled with inflammatory blood, compress the neighbouring smaller ones, whence the passage of the humours through these last is hindered, and thus these raging fits are succeeded by a profound sleep (see §. 774.) and at last an apoplexy, which soon proves mortal. Wherefore those signs which discover an approaching apoplexy ought carefully to be attended to, in order that it may be prevented; seeing it is seldom or never cured when it proceeds from this cause. This is known chiefly, by the redness and swelling of all those parts to which the external carotid artery conveys the blood: for the more the passage of it is stopped in the branches of the internal carotid which are distributed to the brain, the greater quantity will be sent by those of the external to the exterior parts of the head. See what has been said upon this subject in the comments to §. 741. and §. 772.

3.] It was observed before, in the comment to §. 43. that the thickest (*viz.* the red) part of the blood, which naturally is contained only in the larger arteries and veins, receives its motion requisite to life and health from the heart and arteries, and communicates it to the other parts. Whence, as soon as the red blood begins to be deficient, all the actions of the body grow languid and torpid, and its natural heat is very much diminished. This appears plain in young

virgins labouring under the green-sickness; who are not only very pale, for want of red blood; but are likewise languid, averse to all manner of exercise, and appear as it were bloated, with a flesh of a pulpy softness. But, as soon as by the use of filings of steel the hæmatopoietic faculty is restored, and the agreeable red colour begins to return to the cheeks, the strength presently increases, and now full of spirits they delight in that exercise which before they could not endure. Thus, therefore, good red blood is required for a due secretion of the nervous fluid by the fabric of the brain, and upon it likewise depends the equable distribution of heat to all parts of the body. But as the vessels which compose the cortex of the brain, while a person is in health, do not admit the red blood, and far less do the stamina of the medulla, this whole substance is destitute of that cause which excites the heat in us, *viz.* the motion and attrition of the red part of the blood against the resisting vessels. But this defect is supplied by the pia mater, which is thick set with blood-vessels; and not only surrounds the brain, cerebellum, medulla oblongata, and the nerves proceeding from thence, but likewise sinks deep into the sulci and circumvolutions of the brain; and also sends off processes, called the *plexus choroidei*, situated in the bottom of the ventricles of the brain, that an equable heat may be preserved there likewise. Farther, it is very well known, that blood-vessels pass through even the medullary substance of the brain; as injections, and red points conspicuous in the medulla of the brain when it is dissected, demonstrate to us; nay, a blood-vessel passes through the very medullary substance of the optic nerve. When therefore there is a sufficient quantity of red blood in these vessels, the whole substance of the brain is cherished with natural heat, and the secretion of the nervous fluid from the blood is properly perfected. But when the red blood is deficient, thinner liquids must consequently flow through the vessels: and in this case the force propelling those liquids, is either deficient, or at least diminished; and hence they must be accumulated in the vessels, and not propelled.

pelled. But the exhaling arteries breathe out a very subtle vapour into the ventricles of the brain, and likewise between the contiguous surfaces of its membranes, thereby preserving a due softness and flexibility of those parts, and preventing the concretion of them: which vapour expelled from the arteries, ought to be resorbed by the bibulous veins; otherwise there must be a stagnation and an accumulation of that exhaling liquid. But the heat propagated by the red blood over the whole body, is the principal cause which promotes this resorption, by hindering that exhaling liquid from being condensed, and collected in the form of water, in those cavities or interstices of the membranes. Thus you will see, upon opening the belly of a living animal, a dewy warm vapour exhale, which some hours after death, when the carcase is become cold, is found in the form of a liquid in the cavity of the abdomen. So likewise, in old persons, that subtle fluid, which is secreted in the nostrils by the exhaling arteries, is not dissipated into air in the form of vapour, but being condensed, and dropping from the nose, occasions that disagreeable catarrh familiar to old persons; because the *vis vitæ*, being weakened in old age, is not capable of propagating the heat, by vessels which are now become too rigid, to the extreme parts of the body. When, in persons who have been wounded, or women who have miscarried, there happen suddenly a considerable loss of blood, this is presently followed by a very great weakness; and if such persons swallow down great quantities of liquids, the body will thereby be filled with thin humours: but, the heat being deficient, and the circulation languid, these humours will stagnate and be accumulated in the cavities of the body, especially in the parts most remote from the heart, *i. e.* about the feet; whence hydropic swellings, arising from such a cause, usually begin there, and move gradually upwards. But if the red part of the blood is diminished by degrees, as is the case in the chlorosis and leucophlegmatia, then arises a languor which steals upon them slowly, or gradually increases till they are rendered

very weak. In like manner, a watery humour may be accumulated in the cavity of the cranium, and by compressing the brain produce an apoplexy, as appears from medical observations. Columbus^b has the following: "I have oftener than once dissected persons
 " who have died of a violent apoplexy, in whose
 " brains I have found a great quantity of water, trans-
 " parent indeed, but of a glutinous quality." Wepfer^c found a considerable quantity of serum between the dura and pia mater, which burst out with a good deal of force upon wounding the former; and the whole surface of the brain and cerebellum seemed to be covered with a kind of jelly, which being cut with a knife oozed out a serum like that which was collected between the dura and pia mater. But the tunica arachnoidea lying upon the pia mater, and connected to it in several places by very slender fibrils, seems to resemble the tunica cellulosa, and, while the lymph is accumulated between it and the pia matter, to have the appearance of a jelly, which being wounded the contained lymph drops out. The celebrated Schwencke found^d in the body of a very ingenious and active man, not only a quantity of serum between the dura and pia matter, but likewise observed this last raised up into transparent little bladders, resembling hydatids, upon wounding of which a considerable deal of it burst out; and at the same time it appeared, that the same membrane, in the upper part of each lobe of the brain, was almost every where separated, and fluctuated like a loose curtain. I have several times seen the like in dead bodies myself; and in all of them the functions of the brain were hurt before death, altho' all in whom these appearances occurred did not die apoplectic. The same kind of watery collections^e have likewise been observed in the ventricles of the brain under the sheath of the vertebræ.

But as that accumulation of lymph must be produced very gradually, hence the symptoms which shew the functions of the brain to be hurt increase but

slowly,

^b De Re Anatom. lib. xv. p. 265, 266.

^c Hist. Apoplect. p. 16. et 344. ^d Rari Casus Explicat. Anat. Med. p. 27.

^e See the passages in Wepfer just now quoted.

slowly, and the patients are subject to them for several months, and sometimes years, before the apoplexy follows; nay, sometimes they die of other diseases, before such a quantity of lymph is accumulated as by compressing the brain can entirely destroy its functions. Whereas on the contrary, when the vessels are burst, and the blood poured out, an apoplexy for the most part immediately follows, as will appear at N^o IV: whence Aretæus has observed concerning this disease, that it usually indeed attacks very suddenly; but, *nonnunquam etiam habet prælonga initia, gravitatem, motum difficilem, torporem, frigoris sensum, &c.* “some-
 “ times likewise it comes on very gradually, begin-
 “ ning with a heaviness, indolence, numbness, sense
 “ of cold, &c.” Nevertheless, some practical observations inform us, that the head is sometimes suddenly enough overflowed with a collection of serum, and a fatal apoplexy quickly produced, without those signs being observed which are mentioned in the text, and which usually accompany a slow accumulation in the brain. For in an old man of sixty-four, a common labourer, but very sensible, and one who worked hard for his bread, dying about noon of a sudden apoplexy, having followed his business in the morning as usual, and his speech remaining as distinct as formerly, Wepfer^s found in the cavity of the cranium a large collection of serum between the dura and pia mater, between this last and the brain, and in the ventricles of the brain, more especially in the fourth ventricle, under the basis of the brain, and in the sheath of the vertebræ, where the spinal marrow is lodged. In the mean time, the history of this case mentions no symptoms which shewed the functions of the brain to have been hurt before: he was of an unsound bloated habit; and had indulged himself more frequently in his usual large eating a little before his death, and sometimes being very thirsty had drank plentifully of cold water: whence it appears sufficiently evident, that this man was subject to a watery cacochymia. But at the same time there must some sudden cause be added, whereby all

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those

^s Morb. Diuturn. lib. i. cap. 7. p. 35.

^s Histor. Apoplec. p. 422.

those parts should be so quickly overflowed; and it hardly appears probable, that this should happen without a bursting of the vessels, as there were no preceding signs of a gradual accumulation of lymph.

In men of learning, who live a sedentary life, while they grow pale with study, an apoplexy frequently arises from the above cause; but then the disease usually comes on slowly and gradually. For first there is produced a languor, and a love of rest and ease; then the capacity begins to grow dull, and the memory to fail; afterwards they grow sleepy and stupid; and in this state they frequently remain a long time before they die. I have seen, with inexpressible regret, very learned men, and to whom the world was much obliged for their productions, survive themselves as it were for a year or more, forgetting every thing that passed, and at last die apoplectic.

But likewise, by a glutinous inert cacochymia, of which we treated §. 69. *et seq.* the blood may so degenerate, as not to afford proper matter from which the nervous fluid can be secreted; as was said at No I. Wherefore (§. 72.) a deficiency of subtle particles in the blood, and a coalition of the smallest canals, were reckoned amongst the effects of such a cacochymia. But as in old persons a great number of the smallest vessels are abolished (see §. 55.) and the blood abounds with a cold mucous lentor; hence an apoplexy happens frequently enough to them from this cause; and Hippocrates, enumerating the diseases of old-age, has given a list of most of the complaints which usually precede this kind of apoplexy. “ But old persons are
“ subject to a difficulty in breathing, and a catarrh
“ attended with a cough, the strangury, disury, pains
“ of the joints, frenzy, vertigo, apoplexy, cachexy,
“ an itching over the whole body, watchings, looseness,
“ a running of the eyes and nose, dimness of
“ sight, a glaucoma, and dullness of hearing^h.

But an atrabiliary cacochymia may likewise render the blood unfit for the secretion of a sufficient quantity of spirits. For when the more moveable parts of the

the blood, being dissipated from whatever cause, have left the more fixed parts closer united, then it will begin to grow thick, not with an inflammatory, but a pitchy kind of tenacity, consisting of the oily, tenacious, and earthy parts of the blood, united firmly together, as will appear more fully afterwards under the head of Melancholy. Whenever therefore such an atrabiliary tenacity affects the whole blood, then it begins to stick sometimes in the vessels of the brain, rendering them varicous by distending them; and thus the smaller vessels are compressed, while at the same time such blood neither contains proper matter for secreting the spirits, nor easily lets go its more fluid part, strictly adhering to the thicker. Whence we shall see in old melancholic persons, that the circulation of the humours is only performed through the larger vessels, with a slow pulse, and a coldness almost all over the body: they hardly eat or drink; they lie quite stupid; and are no more disturbed with care, though before they were remarkably timid and anxious; nay, almost all the secretions cease in these wretched persons long before death. Thus I saw a woman of a very melancholic habit, who, after she had attempted several times to destroy herself, lay six weeks in bed with her eyes open and awake, but forgetful of every thing, and almost without either eating or drinking: during this whole time she never once went to stool, and made but a very small quantity of urine, indeed not at all for the last week; her extremities were as cold as marble, and her tongue and inside of the mouth very dry. After death, there neither appeared any extravasated humour in the cranium, nor the vessels eroded; but those of the pia mater were distended with a very black pitchy blood. The ancient physicians seem likewise to have known this cause of the functions of the brain being hurtⁱ. They were of opinion indeed, that for the most part, in hypochondriac persons oppressed with atrabiliary humours, the brain suffered by sympathy; but they have likewise expressly said, That

some-

ⁱ De Melancholia Libr. ex Galeno Rufo, &c. cap. 1. Charter.
Tom. X. p. 496.

sometimes the whole mass of blood being rendered melancholic, the brain is immediately hurt^k. The following passage of Hippocrates seems to refer to the same purpose: If the tongue of a sudden loses its power of motion, or any part of the body becomes apoplectic, it is a melancholic symptom^l. It is certain, that Galen, explaining this passage, says, Such complaints may possibly happen, on account of the thickness of the humour, as arise from a viscid and thick phlegm^m. An apoplexy arises from melancholy, when the atrabiliary humour, dissolved, and acrid, is translated to the brain, quickly destroying every thing; but in a manner which will be explained afterwards in the comment to §. 1104: but in that case the disease is suddenly mortal; whereas in this it usually attacks the patient slowly, and after the symptoms mentioned in the text have preceded.

III. Whatever causes compress the arteries, and nervous vessels of the brain, in such a manner as to hinder the blood and animal-spirits from passing through them. Hence, 1. A mere plethora, a plethoric cacochymia, and a very hot constitution, are productive of this disease, especially if the velocity of the blood is increased by violent motion or heat: hence it usually happens to those persons after plentiful eating or drinking; from acrid medicines, and such as operate strongly, such as cordials, volatile remedies, vomits, &c.; from violent heat, and exercise; or intent application of the mind, long protracted, and frequently repeated. 2. Tumours, of whatever kind, arising within the skull, whether inflam-

^k Nonnunquam, universo in venis sanguine melancholico facto, communi læsionis ratione cerebrum lædi. *Ibid.*

^l Si lingua derepente impotens, aut aliqua corporis pars apoplectica evadat, melancholicum illud est. *Aphor. 40. sect. vii. Charter. Tom. IX. p. 312, 313*

^m Fieri posse ut propter humoris crassitudinem tales affectus consequantur, quales ex lenta et crassa pituita ortum habent. *Ibid.*

inflammatory, suppuratory, serous, phlegmatic, steatomatous, schirrhous, or boney, either compressing the arteries, or the union of the veins near the torcular, the medullary origins of the nerves, or the medulla itself of the brain. 3. Too great a velocity of the blood determined towards the head, while its current through the arteries sent to the lower parts of the body is obstructed, which may be produced from a great many different causes. 4. Whatever causes compress the veins without the cranium, which bring back the returning blood from the brain. 5. Humours extravasated on the dura or pia mater, whether bloody, purulent, ichorous, or lymphatic, compressing them externally.

In the preceding number we treated of those causes of the apoplexy which depend upon the faults of the fluid sent to the vessels of the brain, whether it obstructed those vessels by its being too thick, or only so far degenerated from a healthy quality as not to afford proper matter for secreting the animal-spirits: This number treats of those causes of the apoplexy, which, by compressing the vessels of the brain, hinder the free circulation of the humours through them.

1.] That the sole compression of the brain, without any fault of the humours, is capable of disturbing all the animal-functions, and at last of producing an apoplexy, was proved at large, when we treated of Wounds of the Head, and especially in the comment to §. 267. But it was demonstrated in the comment to the first number of this aphorism, that the larger vessels, being distended with too great a quantity of liquid, must compress the smaller neighbouring soft vessels of the cortex of the brain; whether that liquid distending the larger vessels was good and wholesome, as in plethoric persons; or had degenerated into a morbid disposition, as in those of a bad habit. The same thing will happen, as easily appears, from humours

mours extravasated within the cranium; whether this happens suddenly from the vessels being ruptured (of which we shall speak in the following number); or whether being gradually accumulated, and increased in their bulk, they compress the brain. Tulpius^a mentions a case of this kind, of a torpid dull man, who died suddenly of an apoplexy; in whom, the skull being opened, the membranes of the brain were covered with such a quantity of phlegm, that it was necessary to wipe it off with a sponge.

But in persons who are plethoric, and of a very hot constitution, in whom the humours, which are thick and acrid, are moved through strong vessels with a more remarkable velocity^b, an apoplexy chiefly threatens, when the circulation, from whatever cause, is quickened, or the heat increased; for the blood is rarefied by heat, and the vessels which contain it are thereby distended, (see §. 106, *a*.) Piso^c relates two cases of this kind: one, of a person, who by sleeping with his head inclined downwards towards the fire, fell down apoplectic, and died in a short time; the other, of one, who in the day of intermission of a tertian fever, by exposing himself too long to the scorching heat of the sun in the dog-days, became suddenly apoplectic, and died the day following by the violence of the disease. It is obvious enough, that the same thing is to be feared, if the blood, exceeding in quantity, is moved too quick, and rarefied by too great exercise: of which I lately saw an instance in a man of fortune, who was taken with this disease while he was hunting; but as the vessels of the brain happened at that time not to be ruptured, but only too much dilated, he was happily restored to health. But when these plethoric persons eat and drink too plentifully, especially of spirituous liquors, they are exposed to a great deal of danger: for both the quantity of chyle, being increased, suddenly distends the larger vessels; and the stomach, swelled with the aliments, compresses

^a Lib. i. Obs. Med. cap. 27. p. 54.
sect. 890.

^b H. Boerhaave Instit. Med.

^c De Morb. a Colluv. Serosa, sect. 2. part. 2. cap. 5.

ses the vessels and viscera of the abdomen, and hinders a free motion of the diaphragm, whereby the lungs being less easily dilated the venous blood cannot return so freely from the head, while in the mean time the arteries are very full. Thus we see, after plentiful feasting, all the guests have their faces become flushed, turgid, and their eyes red; nay, frequently they even become sleepy and stupid. This is the reason why so many persons, who live intemperately, fall down apoplectic in the middle of their jollity. Besides, there is a very bad custom which prevails amongst many people, of carrying about them those apoplectic spirits, as they are called, gilded powders, balsams, and the like, which are all composed of very hot acrid aromatics, and are usually cried up as the most effectual prophylactic remedies against this disease; while in the mean time, by increasing the motion of the humours, and heat, they are extremely hurtful to persons who are plethoric and of a hot constitution. Vomits likewise are exceedingly dangerous in the same case: for, in the act of vomiting, even in those who have not too much blood, the face grows red and swelled; the eyes become bloodshot, with the appearance of sparks of fire before them; and there is a swimming of the head, because the blood is sent thither in too great a quantity and with impetuosity; while, the respiration being obstructed by vomiting, the right ventricle of the heart cannot empty itself freely, and hence the veins of the head cannot readily be unloaded. For this reason, skilful physicians usually order blood to be let first, in diseases where they find a vomit to be necessary; as was remarked upon another occasion in the comment to §. 656. Hippocrates has collected some of the signs which usually accompany too great a fullness of the vessels in the head; and at the same time warns us of the consequences to be dreaded from thence: “Persons who
“are subject to head-achs and a noise of the ears
“without a fever, in whom a vertigo attends with
“dimness of sight, a slowness of speech, and a numb-
“ness of the hands; you may expect they will ei-
“ther

“ ther become apoplectic, epileptic, or lose their memory ^d.”

Too close application of the mind is likewise very hurtful to those people; for all who apply themselves to very hard study feel their head burdened, and a disagreeable tension of the brain, when their studies are too long protracted: hence, if a plenitude of the vessels has preceded, it is plain that all these symptoms must be increased; especially if after a plentiful meal they sit down to their desks, with a full stomach, and the body inclined forwards, immersed in profound meditation.

2.] It appeared sufficiently plain from what was said before, that whatever is capable of compressing the brain may justly be reckoned amongst the causes of the apoplexy, seeing the hard bones of the cranium will not give way in adults; and therefore every effect of a tumour, of whatever kind, produced within the cavity of the cranium, must act upon the soft substance of the brain. In N^o II. we treated of the inflammatory thickness of the blood, as far as, by obstructing the vessels, it hinders the free motion of the humours, and thus may disturb or entirely abolish the functions of the brain: but from the arteries being obstructed and distended with inflammatory blood, arises a tumour, as was demonstrated in the comment to §. 382; and from this tumour a compression. It is frequently observed in practice, that a fever appears in a sound person without any evident antecedent cause; and some hours after, some part or other of the body being seized with an erisipelas, or a true inflammation, swells considerably, the fever then going off. When this tumour arises upon an external part of the body, it is easily suffered and removed; but if that inflammatory matter should fall in the same manner upon the vessels of the brain, and occasion a tumour there, a fatal apoplexy must shortly follow; as we observed upon another occasion in the comment to §. 593.

An inflammation being produced in the cavity of the

the cranium, all its effects may follow; and therefore a suppuration amongst the rest. Whence it may happen, that a small inflammatory tumour, which is very little hurtful on account of its smallness, yet by suppuration being increased more and more in its bulk from the collected pus, may at last destroy all the functions of the brain, unless the pus finds out a way whereby to evacuate itself. A great number of observations have confirmed this doctrine, and several of this kind were mentioned in the history of Wounds of the Head, to which I shall only add one very extraordinary case. A certain nobleman, while he was giving orders to his servant, suddenly lost his speech, and all his senses. Various remedies were tried upon him without success, and he remained for some weeks buried in profound sleep. This was followed by a restless agitation of the body; and afterwards by convulsions, which ceased upon a plentiful discharge of pus from the mouth and nose. Nevertheless he slept rather more profoundly, till by the advice of a quack a number of cupping-glasses were applied to his head: thus, after the space of six months, his senses and speech immediately returned; and the same servant, whom he was giving orders to when he was taken ill, happening to be by, he went on to finish his orders which he was giving when he was first seized, being insensible of all the intermediate time that had passed. He lived in good health ten years after, and then died of another disease^c.

There have also been such like ferous tumours found in the cavity of the cranium, containing a collection of lymph under a thin membrane; and these likewise are capable of producing an apoplexy, when they are increased in their bulk. An observation of this kind you may read in the Edinburgh Medical Essays^f, which was afterwards confirmed by a dissection of several bodies who died of the like disease. Wepfer^g several times observed tumours of the same kind, in brutes; nay he relates, that a vertigo frequently happens to

^c Académ. des Sciences, 1719. Hist. p. 29.^f Vol. III. sect. 23.^g De Apoplexia, p. 63.

black cattle in the district of Underwold in Switzerland, which the herdsmen cure in the following manner: They strike upon the skull, behind the horns, with a small hammer, and from the sound they discover whether there is any preternatural cavity under the skull; which when they suspect, they immediately bore through the part which they beat upon, and by means of a reed, which they introduce through the hole, they suck out such small bladders as are above mentioned: which if they are situated on the surface of the brain, the cure succeeds; but if they are deeper lodged in the substance of the brain, they have no hopes; wherefore the butcher who is present, when that is the case immediately kills them. In another place he affirms, that he saw the experiment made, when, after several hydatids, some of which were as big as a nutmeg, had been sucked out, and the vertigo did not cease, the animal was immediately killed; and in the ventricles of the brain, especially the left, he found several hydatids of the same kind^h. It may be asked, if such diseases are to be found in men? It is certain, that in those cases which are related in the place above quoted of the Medical Essays, there remained a fixt pain in a particular part of the head; and in the bodies, when they were dissected, the dura mater, at that part under the skull, was raised into a tumour about the size of a nutmeg, and contained a bloody serum. But it would have been in vain to have evacuated that small quantity of serum by trepanning the skull, seeing there was a much greater quantity lodged in the ventricles of the brain. But Wepferⁱ has collected several observations of celebrated physicians, which inform us that various other kinds of tumours, steatomatous, schirrhous, &c. have been found in the brain of persons who died of the apoplexy. Besides, there have likewise been flatulent tumours here observed, which also by their bulk may compress the brain. Thus in Willis we read the following: “ Upon opening the head soon after death,
 “ I have frequently seen the pia mater distended and
 “ pellucid like a bladder, so as to appear as if it was
 “ swelled

^h Ibidem, p. 370.ⁱ Ibidem, p. 612. et seq. et alibi passim.

“swelled with water contained under it; which,
 “however, was found to be entirely owing to air;
 “for, upon dissecting it, the swelling immediately sub-
 “sided^k.” But of the principal causes, by which air
 lying concealed in our liquids may be extricated, we
 treated before in the comment to §. 647, when speak-
 ing of the causes of flatulæ.

Bony tumours likewise arising within the cranium
 may produce a compression of the same kind. These
 are occasioned either by a depression or fracture of the
 skull, of which we treated in the history of Wounds
 of the Head; or when the substance of the bone swell-
 ing by degrees, occasions a tumour called an *exostosis*.
 In an inveterate pox we frequently enough ob-
 serve an exostosis of the cranium, swelling outwards;
 nor does it seem improbable, that exostoses of the same
 kind may sometimes be produced in the internal side
 of the cranium from the like cause. I remember once
 to have seen a case of this kind, where the symptoms
 made it justly suspected that there was an internal ex-
 ostosis of the skull; but as I had not an opportunity of
 examining the head after death, I dare not affirm that
 it was certainly so. Sometimes likewise there have
 been observed morbid ossifications in the membranes
 of the brain, which by increasing in their bulk may
 likewise do mischief, though they must hurt more fre-
 quently by pricking and lacerating the membranes and
 vessels with their sharp points. In a youth of nineteen
 years of age, two such bones were found on the right
 side of the longitudinal sinus, upwards of four lines in
 diameter, rough with sharp spikes, which, perforating
 the dura mater, occasioned a very violent head-ach, as
 long as he lived^l. But all those tumours will produce
 the same effect, whether, by compressing the arteries
 which carry the blood to the brain, they hinder the due
 repletion of the vessels of the pia mater, and of the
 cortex of the brain, requisite for the secretion of the
 spirits; or, by straitening the veins, they occasion too
 great a fulness in the blood-vessels, whereby the other

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smaller

^k Cereb. Anatom. cap. 9. p. 117.
 1713. Hist. p. 29.

^l Academ. des Sciences, l'an

smaller vessels are compressed; or, lastly, by compressing the origins of the nerves in the medulla cerebri, or oblongata, they check the free motion of the secreted spirits through the nerves to the organs of sense and the muscles.

3.] It was said before, that, from too great a quantity of good blood in the body, the blood-vessels of the brain may be so distended, that the animal functions may thereby be hindered. But it is likewise observed, that the vessels of the brain may be rendered too full, although an universal plethora does not prevail, if from any cause the passage of the blood thro' other parts of the body happens to be prevented; and then an apoplexy is produced, not from an universal plethora, but from a particular one of the vessels of the brain. The causes of this kind may be very numerous; but I think they may be reduced to three principal classes: The 1st contains all those which by compression straiten the vessels going to the lower parts of the body; the 2^d includes those which accelerate the motion of the venous blood towards the right ventricle of the heart, whilst its free passage through the lungs is at the same time hindered; the 3^d comprehends spasmodic contractions of the vessels. I shall examine each of these classes as concisely as possible.

1st. How productive too great a corpulency is of the apoplexy, by compressing the blood-vessels dispersed over the whole trunk of the body and the extremities, we saw in the comment to the first number of this paragraph. In the third number we treated of the great danger, which might arise from the stomach's being too much distended by eating and drinking, whereby the neighbouring vessels and viscera are compressed. For in this case what Hippocrates^m says may happen; “ If the veins spue out (their blood) upon
“ the head, the whole head will be in pain for a short
“ time; and this will be communicated to the neck,
“ and sometimes to other parts: afterwards, when the
“ person recovers from that, he feels a swimming in
“ the head, attended with dimness of sight: but he
is

^m De Morbis, lib. ii. cap. 6. Charter. Tom. VII. p. 557.

“ is not feverish.” That Hippocrates means here too great a fullness of the vessels of the head, appears from thence, that he ordered the skin of the head to be cut, to give vent to the blood, and thereby to diminish the plenitude. In like manner the uterus, especially towards the end of pregnancy, is very much distended; and so, by compressing all the neighbouring parts, may increase the force and quantity of blood sent to the head: and Hippocrates seems to have had his eye upon this, when he makes the following observation: “ Head-achs, attended with a heaviness, “ and a great inclination to sleep, are bad in pregnant “ women; and they run a risk of being seized with “ some convulsive symptomⁿ.” Where I must observe, that interpreters have remarked, that *τας επιφορας* does not mean simply pregnant women, but such as are near their time. I have seen an apoplexy prove quickly mortal, which seemed to be owing to this very cause: and for this reason sometimes they die suddenly convulsed from a strong effort in labour; which I have likewise seen, while, by that violent nixus to expel the foetus, the vessels of the brain have been too much filled; of which we shall presently treat more at large.

2d. For when the motion of the venous blood is accelerated towards the heart, and the lungs transmit the blood less freely at the same time, then the right sinus venosus and auricle remain full; and, therefore, the venous blood returning from the head cannot be evacuated from the jugular veins; hence the veins and sinuses of the brain remain full, while the arterial blood continues still to be conveyed to it. By this means there is a resistance made to the arterial blood, in its passage to the veins: and thus all the blood-vessels of the brain are too much distended and disturbed; and, the complaint increasing, all the functions of the brain are abolished; as was said upon another occasion in the comment to §. 774, treating of the mortal Phrenitis succeeding the Peripneumony; as like-

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wise

ⁿ Prædict. lib. i. Charter. Tom. VIII. p. 773. Coac. Pranot. n^o 517. et 534. *ibid.* p. 882, 883.

wife in the comment to §. 807, speaking of the suffocation of the brain in the Quinsy. But in coughing, vomiting, or laughing, by the concussion of the muscles the motion of the venous blood is accelerated towards the heart, and the respiration hindered; wherefore these actions are the readiest to occasion a sudden repletion of the blood-vessels of the brain. Hence that immoderate laughter (*γέλως ασέλγος*) is justly reckoned among the causes of the apoplexy by Aretæus°. But the greatest danger of all is in that violent effort which women in labour make at the time that the fœtus is expelled; as likewise when men attempt to lift burdens, or remove obstacles, which exceed their strength: for we see plainly, at that time, that all the muscles swell, and at that instant the air which is drawn in is retained. But the belly of a muscle while it acts becomes pale, while at the same time it swells and protuberates^p, wherefore it squeezes out all the red blood from its blood-vessels; and while this is done, all the muscles in the body acting at the same time, the other vessels, which cannot be compressed with muscles, are so much the more filled, the motion of the venous blood towards the right ventricle is accelerated, and the pulmonary vessels are compressed by the air which is drawn in and retained in the lungs; whence there necessarily follows a great fullness of the vessels of the brain. Hence we see, in those violent efforts, the face grow turgid, the eyes very red and prominent; and when that violent dilatation of the vessels of the brain has been frequently repeated, the fibres which compose them (see §. 25, n° 3.) are so much weakened, that they afterwards yield to a gentler impulse, and become too much filled from slighter causes. I have seen this very plain in a celebrated singer, who could lengthen out surprisngly very sharp notes, with a sweet modulation of voice; but then you could easily perceive all the vessels of the head become very much distended. But these vessels being frequently in this manner over-stretched, they were thereby so much weak-

° De Causis et Signis Morbor. Diuturn. lib. i. cap. 7. p. 35.

^p H. Boerhaave Instit. Medic. sect. 401. n° 7.

weakened, that afterwards, if she only attempted to sound three acute notes, she was immediately seized with a vertigo, and would fall down unless she presently stopt. She left off singing for some years, and made use of baths for her feet, and other remedies to divert the force and quantity of humours from the head; and thus the vessels, weakened by being over-stretched, recovered strength by degrees, so that she was capable afterwards of singing; always, however, taking care not to spin out these acute notes too long; for if she did, she was immediately seized with a vertigo.

3d. But too great a fulness in the vessels of the brain, may likewise be occasioned by spasmodic constrictions of the blood-vessels: for the arteries do not act simply as elastic canals, which when they are filled by the heart make a resistance, while the action of the heart ceases in the time of its diastole; but they have also muscular fibres, by the contraction of which their cavities can be straitened, as was said in the comment to §. 631, where we treated of Anxiety arising from this cause. But from what was said in the comment to §. 104, it appeared, that passions of the mind can suddenly change the capacity of the vessels, and surprisingly disturb all the functions of the brain. When a person is struck with very great fear, all the external parts of the body become pale, by the contracted vessels repelling the red blood inwards: likewise a trembling of the joints, a sudden and excessive weakness, convulsions, &c. sufficiently demonstrate, that the functions of the brain are hurt by this affection of the mind. Nay, we learn from a surprising instance, that by such a cause all the actions of the brain may be abolished; all the voluntary motions and senses having been quite effaced, for the space of two months, in a person, from a sudden fright⁹. Whence likewise Aretæus^r reckons immoderate perturbations of the mind, and sudden frights, amongst the causes of the apoplexy.

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⁹ Académ. des Sciences, l'an 1713. Mem. p. 419.
Diurn. lib. i. cap. 7. p. 35.

^r Morbor.

It may be asked, whether, in violent affections of the mind, the repletion of the vessels of the brain is increased, because the respiration is disturbed at the same time? When a person is seized with sudden anger, he holds in his breath, and presently after vents his passion in words and blows. What sighs do we observe in persons afflicted with grief, by which they endeavour to alleviate that anxiety which they feel about the vital organs! How short and panting is the respiration in men who are struck with sudden terror! When boys are chid by severe masters, the respiration ceases for some moments, and presently after the whole face begins to redden, the muscles of it are distorted, the hands tremble, the tongue stammers, and they burst out into a flood of tears, attended with frequent sighs; nor do these commotions cease, till the respiration is rendered quiet again. Neither can the other affections of the mind, if they are violent, be composed, till, after fetching a deep sigh or two from the bottom of the chest, the respiration which was disturbed is afresh quieted. Hence Virgil, when he describes Neptune keenly reproaching the winds, makes him pause a while till he recovers himself from his passion, leaving him time as it were, that, the respiration being quieted, the short madness might go off:

Quos ego . . . sed motos praeſtat componere fluctus.

“ Whom I . . . but first I’ll quell the bounding waves.”

But it easily appears, that that repletion of the vessels of the brain will be so much the more considerable as those vessels resist less: hence what disturbances frequently happen in the bodies of delicate young girls from a very trifling cause! while robust men, and those whose vessels are strong, feel no manner of change from causes of the same nature. Hence likewise in the former, from the stomach being filled with aliments, or even distended with wine, head-achs, vertigos, &c. are so frequently produced, especially if in the rest of the body the vessels being contracted with spasms obstruct the free circulation of the blood. Sydenham,

denham, who has most accurately described all those various and surprising symptoms with which hysteric and hypochondriac persons are afflicted, observes, That “ frequently enough a remarkable coldness of the “ external parts of the body paves the way, as it “ were, for these symptoms, and frequently does “ not leave them till the paroxysm is gone off, “ which coldness I have oftener than once found equal “ to that of a dead body, the pulse in the mean time “ continuing as in health^s.” But that coldness plainly shews, that the motion of the blood is hindered through the external parts of the body; and, therefore, that it must be more hurried through the internal; whence the functions of the brain are often in those persons so surprisingly disturbed. Hence whatever determines the force and quantity of the blood from the head to other parts of the body, is useful in diseases arising from such a cause. Hippocrates has likewise remarked this, where he says, *The bleeding piles, if they happen to apoplectic persons, are of service; but coldness, and numbness, are bad symptoms*^t.

4.] We saw in N^o II. that the arteries going to the brain may be obstructed, so as to hinder the free passage of the blood thither. But at the same time it appeared, that an apoplexy is seldom produced from this cause, seeing there are four distinct arteries which serve for this purpose, and they are not easily obstructed all together; and besides, the vertebral arteries are united in such a manner with the carotids by intermediate branches under the basis of the brain, that any defect of the obstructed canals may be supplied by the others which continue open. This is confirmed by an observation of Willis^u: for he saw in a person who had enjoyed the free exercise of the animal-functions till his death, the right carotid artery evidently bony, or rather of a stony nature, its cavity being almost totally

^s Differtat. Epistol. ad Guilielm. Cole. p. 491.

^t Apoplecticis si hæmorrhoides superveniant, utile: frigiditates vero et torpores, malum. *Coac. Prænot. n^o 478. Charter. Tom. VIII. p. 880.*

^u Cerebri Anat. cap. 7. p. 95.

tally abolished. He had suffered indeed at first a violent pain in the left side of his head, while the left carotid and all its branches were too much distended with blood; but, the right vertebral artery being at last gradually dilated to three times its natural width, that pain went off, nor did the obstruction of the right carotid occasion him much trouble. But when the veins are compressed, there is greater danger lest the brain should be overflowed with blood, while the arteries continue constantly conveying it thither: hence arises such danger from laughing, coughing, or vomiting, by the free return of the venous blood from the head being hindered, as was said not long ago. Hence likewise we see, that very great care is taken to prevent the veins of the brain from being easily obstructed; for the sinus venosi within the cranium are able to contain a great quantity of blood, and thus make as it were a kind of reservoirs, where part of the venous blood may be collected, and remain for some time, while the free evacuation of the jugular veins is hindered. Besides, the veins of the head go out of the skull by distinct foramina, without any artery attending them, lest they should be compressed by it when sometimes it is too turgid: but the jugular veins are so situated in the neck, that they cannot be obstructed by the muscles when in action. Hence we so often see persons seized with a swimming in the head, from the collar being too tight, whereby the jugular veins are straitened; while the carotids, on account of their deeper situation, at the side of the windpipe, remain free from compression: for the same cause scrophulous tumours produce the like effects. It has likewise been observed, that, from tumours in the cavity of the thorax, the superior vena cava, into which the jugulars empty themselves, was compressed in a girl of eight years of age, who died of an apoplexy^v.

Persons strangled with a halter, seem to die apoplectic. For, as soon as they are hung up, the jugular veins being compressed, the whole face immediately swells and grows red, although the moment before they

^v La Motte Traite complete de Chirurgie Tom. II. p. 186.

they were quite pale with the fear of death; afterwards it grows livid, nay, becomes almost black, from the blood being accumulated in the swelled veins; the lips become very much swelled; a snorting noise is heard in the breast; the livid tongue is frightfully protruded; and a thick clammy froth is discharged from the mouth and nose; while the arteries cannot empty themselves into the veins, and force the blood violently into the lateral secretory branches; then for the most part they are convulsed, and presently death follows. But that froth is not discharged from the mouth of those wretches, till all the vessels of the brain have first been entirely obstructed and distended. Whence Hippocrates has said, (as before observed on another occasion,) “Persons who are strangled, and freed (from the halter,) before they are quite dead, if froth is discharged from their mouth, do not recover^x.” Galen^y however observes, in his comment upon this passage, that some, in whom this froth appeared after being strangled, have recovered. Several observations have confirmed this opinion of Galen since; and it seems very probable, that if the turgid vessels of the brain in persons who have been hanged have not been burst, nor the humours extravasated, nor the blood by stagnating become so far coagulated that it cannot pass any more through the vessels but remains in them unmoved, then life may return. I have known it happen to anatomists, that the day after the execution, when they were preparing to dissect a body that was hanged, they have found the person alive whom every one imagined to be dead. Wepfer^z relates a remarkable case of this kind, of a condemned woman, who, after having hung half an hour, perfectly recovered; although her relations, being desirous to dispatch her quickly, pulled down her feet, beat her breast with their fists, lifted up her body and then pulled it down violently to tighten the rope the more; and this they did with such force, that the officers, who attended the execution, being afraid lest the cord should

^x Aphor. 43. sect. ii. Charter. Tom. IX. p. 82.

^y Ibid. ^z De

Apoplexia, p. 167.

should give way, hindered them from persisting in their cruel kindness. It appears from all the symptoms which were observed in this woman, while she recovered her health gradually, that the animal-functions were chiefly hurt; and these being afterwards greatly restored, and the symptoms depending upon the great contusion and distension of the parts removed, there only remained a swimming of the head; which, as was said before, is usually the first symptom of beginning diseases of the brain, and the last which remains when these patients recover.

5.] As the bony skull in adults cannot yield, and its cavity is always full, hence humours extravasated there must necessarily compress the brain, as was said before in the comment to §. 273, where we treated of Wounds of the Head: but that a moderate quantity of extravasated liquid is sufficient to produce an apoplexy, appears from that case, which Wepfer^a quotes from Fernelius, of a man, who from a violent blow on the left eye was seized with an apoplexy, and died in twelve hours: in the body, when it was opened, there was found no cause of so sudden a death, besides two spoonfuls of extravasated blood in the basis of the brain. But of the causes, which usually produce this extravasation of the humours in the cavity of the cranium, we shall treat in the following number.

IV. All the causes which destroy the arterial, venous, or lymphatic vessels of the internal substance of the brain, near its cavities; in such a manner, that the extravasated liquid, being accumulated, by its compression is capable of hurting the vaulted origins of the nerves of the brain. Such are, Acrid serum in hydropic and leucophlegmatic persons; blood in plethoric persons; atrabiliary acrimony in melancholic, in scorbutic, and in gouty persons, which last cause commonly acts between the age of forty and sixty; all which

^a Ibid. p. 579.

which latent qualities being excited by moving causes, frequently give sudden rise to this disease. The fore-knowledge therefore of this disease being threatened, ought to be learnt from the nature of the latent matter, and the exciting causes being known. Violent affections of the mind, and intense study, are chiefly hurtful to these persons.

It appeared before, how an apoplexy might be produced from the humours being accumulated, but not yet extravasated: but the vessels being broken by too great distension, or eroded by an acrid liquid, an extravasation of humours is occasioned, which may suddenly produce a fatal apoplexy; especially if the extravasated humours, falling upon the basis of the cranium, compress the medulla oblongata. That the serum, by long stagnating in hydropic and leucophlegmatic persons, may become acrid, and erode the parts where it is repositied, will appear from what we shall say afterwards in treating of the Dropsy. Practical observations likewise seem to teach us, that there are sometimes sudden enough extravasations of lymph produced in the cavity of the cranium, which, unless they soon find an outlet by ways not yet well known to anatomists, will produce an apoplexy. Thus Willis ^a informs us, that he had known several persons frequently subject to swimmings of the head, who had a very plentiful discharge of limpid water from the nose; and after this evacuation, the vertigo immediately ceased. Further, in a young virgin, who had been long afflicted with a violent head-ach, a deal of yellow thin serum was daily discharged from her nose; and after this excretion had continued for some time, she was seized with violent convulsions, attended with numbness, and died apoplectic. Upon opening the head, the same kind of yellow serum had overflowed all the convolutions and ventricles of the brain. Wepfer ^b likewise relates a case of the same kind.

But the apoplexy happens much more frequently from a rupture of the blood-vessels within the brain, either by too great a quantity of blood, or by its sudden rarefaction: whence the celebrated Hoffman^c has called this species of apoplexy an hæmorrhage of the brain; and has treated of it in that part of his works where he relates successively the various kinds of hæmorrhages. But the apoplexy arising from this cause suddenly kills; and so much the sooner, the more copious and quick the extravasation of blood happens to be. The famous Malpighi died of this kind of apoplexy in the space of four hours, having suffered a gentle fit of it with an hemiplegia of the right side about four months before. Upon opening his body, Baglivi found about two pounds of black grumous blood in the right ventricle of the brain; and in the left, about half an ounce of a yellow water^d. It appears very probable, that the extravasated lymph in the right ventricle of the brain had produced the first gentle fit of the apoplexy, with an hemiplegia on the right side, of which he in some measure recovered: but the extravasated blood was in so large a quantity, that the last apoplectic paroxysm proved suddenly mortal. In the Philosophical Transactions^e, where the same observation is inserted, it is said, that there were only two ounces of extravasated blood found in the right ventricle of the brain; but as Baglivi was an eye-witness of the thing, I think we ought to believe him. But even two ounces of extravasated blood are sufficient to produce a mortal apoplexy, as appears from the observation of Fernellius just now mentioned; nay, a single spoonful of extravasated blood produced a fatal apoplexy, though the most powerful remedies were immediately used for the recovery of the patient^f. It must be observed in this case, that the blood was poured out from a vessel, which ran through the substance of the brain: but it is certain, that the blood-

vessels

^c Medic. Ration. et Systemat. Tom. IV. part. ii. sect. i. cap. 7. p. 163. ^d Bagliv. Oper. Omn. p. 681. ^e N^o 226. p. 467. Abridgment, Vol. III. p. 30. ^f La Motte Traite Complet de Chirurg. Tom. II. p. 362.

vessels are only found in the medulla, and not in the cortex of the brain; and therefore the extravasated blood every where compressed the medullary substance in which it was collected; and thus, although it was in a smaller quantity, might produce an apoplexy.

But if good blood extravasated in the cavity of the brain is capable of producing such bad effects, worse still are to be expected if any remarkable acrimony prevails in the blood; for the vessels thereby will be more easily broken, and such blood extravasated in the tender substance of the brain will quickly destroy it. In what manner the atrabiliary blood, by its pitchy tenacity alone, can produce an apoplexy, has been said in the comment to No II.; and at the same time it was remarked, that the most sudden destruction was occasioned, if the atrabiliary humour, dissolved and rendered acrid, should happen to be propelled through the vessels of the brain. Hippocrates seems to have warned us of this, where he says, *Restless nights in melancholic diseases during these seasons, prognosticate either an apoplexy, convulsions, madness, or blindness* §. Now from the aphorism preceding this, where he observes that gouty complaints are chiefly troublesome in spring and autumn, it evidently appears that in this place he speaks of the atrabiliary matter received into the circulation. At the same time it is worth while to observe, that he calls it *αποπληξιν τῶ σωματι*, or a true apoplexy, properly so called; for Hippocrates himself has sometimes called a palsy of a particular part an *apoplexy*, as was said before in the comment to §. 1008. But to this aphorism is immediately subjoined the following: *But persons are most subject to the apoplexy from the age of forty to sixty* ^h. Galen in his comment upon this passage observes, that not every kind of apoplexy is here understood, but only that which is produced from black bile: but that melancholy most frequently happens at that time of life, will appear afterwards in

K 2

the

§ Morbis melancholicis per has tempestates periculosi decubitus, aut apoplexiam corporis, aut convulsionem, aut maniam, aut caecitatem denunciant. *Aphor. 56. sect. vi. Charter. Tom. IX. p. 287.*

^h Apoplectici vero maxime fiunt ætate a quadragesimo anno usque ad sexagesimum. *Ibid. p. 288.*

the comment to §. 1108.

But the scorbutic acrimony is likewise of such a nature, as to dissolve the vessels very easily, and occasion extravasations all over the body; as those scorbutic spots, which rise spontaneously, or upon the slightest pressure, evidently demonstrate. Whence convulsions, tremblings, and a palsy, are afterwards reckoned among the symptoms of the worst kind of scurvy, §. 1151, no 4. Wherefore there is danger lest such erosions of the vessels of the brain should happen in this disease. In the mean time practical observations seem to teach us, that the brain is more seldom affected from a scorbutic acrimony; for in bodies of persons who have died of the scurvy, several of the viscera have been found very much diseased, nay, sometimes all the internal parts almost putrefied, while the brain in most of them appeared quite entire ⁱ.

The same thing happens likewise in gouty persons: for if the gouty matter, which is capable of converting the tendons and ligaments into a kind of chalk, is no longer deposited in the extremities, but falls upon the viscera, it produces terrible complaints; and if it is determined to the brain, occasions apoplexies, palsies, &c. as will afterwards appear in the comment to §. 1273.

But an apoplexy produced from extravasated humours, occasioned by a sudden bursting of the vessels, seems to be that which Hippocrates calls *vehement*; concerning which he justly observes, *It is impossible to cure a vehement apoplexy, and not easy to cure a slight one* ^k. How little hope there is of curing such an apoplexy, we shall see afterwards in the comment to §. 1033. But a slight apoplexy is that, which is produced from a slow congestion of humours in the head: concerning which we treated in the comment to No II. 3. which, however, is likewise difficult to be cured.

But such causes as suddenly erode the vessels, may lie concealed in the body, without producing any effect

ⁱ Acad. des Sciences 1699. Memoir. p. 246.

^k Vehementem quidem apoplexiam solvere, impossibile; debilem vero, non facile. *Apher. 42. sect. ii. Charter. Tom. IX. p. 81.*

fect, unless they are rendered active by some other acceding cause, or determined towards the head. Thus the atra-bilis may remain fixed for years; and afterwards being suddenly dissolved, and moved by the exercise of the body, the heat of the air, &c. it produces violent complaints. The gouty matter, when it begins to lodge itself in the feet, if by the imprudent use of narcotics, refrigerants, or restringents, it is hindered from being entirely deposited there, is frequently determined to the head, to the great danger of the patient. In persons who are subject to a profuse bleeding at the nose, if it is imprudently checked, sometimes an artery bursts in the brain, and the blood suddenly extravasated produces a fatal apoplexy. There is a case of this kind in the Philosophical Transactions¹, of a lady of quality who was very anxious in stopping a plentiful hæmorrhage of the nose; but next day she was suddenly seized with a most violent headache, and died in half an hour. After her death there was found, in the very substance of the brain, a clot of congealed blood, weighing about an ounce and a half, which had formed a large cavity for itself, and thus very much compressed all the neighbouring parts.

But an apoplexy of this kind may be foreseen, if the proper signs discover that there is too great a quantity of red blood, or too great acrimony prevailing in the humours; and if at the same time it appears, that such causes have been applied to the body, or are shortly to be applied, which increase its motion considerably, rarefy the fluids, suppress the usual evacuations, or hinder the morbid matter from being lodged in places where there is less danger. Thus, for example, in a plethoric person, I easily suspect that an apoplexy is to be feared, if I know that he is to undergo violent exercise in a very hot season, or will drink too liberally of a generous wine. So likewise, in a gouty person, if, either from the weakness of decrepid old age, or from the extremities being so much hurt by repeated paroxysms of this disease, the morbid matter can no longer be collected in them, the feet are not pain-

¹ No 173. p. 1068. Abridgment, Vol. III. p. 29, 30.

ful, but the patient complains of an oppression and swimming of his head, I can foresee this disease; and the same is true of the rest of the conditions above-mentioned.

But how much those persons who are predisposed to the apoplexy may be hurt by violent affections of the mind, and intense study, was said in N^o III.

V. Hither some kinds of poisons are referred, which nevertheless either act in the same manner as the three last mentioned causes (N^o II. III. IV.) or rather hurt the lungs before they affect the brain.

It is certain, that there are such poisons, as effectually disturb those functions which depend upon the sound state of the brain and nerves, although it does not appear how they act, and to which of the classes of causes above-mentioned their action ought to be referred. But many of those produce the very worst effects while they remain in the stomach, and as soon as they are expelled all the complaints cease; as was said at large in the comment to §. 229, 701, where we treated of Delirium in Fevers. These poisons are enumerated in another work of our author^m, where they are to be seen. But it does not appear probable, that these poisons act by inspissating the liquids, or compressing or breaking the vessels, seeing their action ceases as soon as they are expelled by vomiting. We are ascertained, therefore, of their effects by careful observations; but the manner how they are produced, is not clearly understood. There are likewise other poisons, which in the form of a vapour produce an apoplexy in a moment: such is the steam of fermenting liquors, especially if it is drawn up the nose through a small hole out of a large cask; or if a person goes into a cellar where there is a very large quantity of the fumes of fermenting liquors; as I remarked upon another occasion in the comment to §. 605, n^o 11. Helmont, while he was too eager in examining of minerals,

^m H. Boerhaave Instit. Med. sect. 1138.

nerals, had like to have fallen down apoplectic by a poisonous vapour of this kind. “ For (says he) unless
 “ I had turned my head from the vessel, from which
 “ the poisonous vapour arose, I should have dropt
 “ down apoplectic, and was just ready to fall: And
 “ now my arm fell useless, and my leg became numb
 “ and incapable of feeling or motionⁿ.” But he seems frequently to have been exposed to this danger, for he affirms that he was threatened with an hemiplegia of the left side; and elsewhere he says, “ I remember
 “ likewise, that once, upon my first applying myself
 “ to chemistry, I distilled some virulent substances of
 “ a poisonous nature, from the least odour of which,
 “ either escaping from the joints happening not to be
 “ well luted, or afterwards catching me unawares upon separating the vessels, I was in a moment ready to
 “ fall with a swimming in my head and a numbness of
 “ of my right side. So that if that vapour had only
 “ struck me once more, without doubt I should have
 “ fallen down apoplectic. To such danger did I expose myself formerly, from an ardent desire of
 “ knowledge, that I thereby a thousand times endangered my life^o.” It is true indeed, that spirit of sulphur, of nitre, of sea-salt, oil of vitriol, &c. while they are sucked in with the air in the form of a vapour, by constringing the lungs, occasion sudden death; and therefore are hurtful rather to the lungs, than to the brain: but Helmont has made no mention of the respiration being hurt by that poisonous vapour which he drew in. But neither do those persons, who dwell in houses that have lately been plaistered with lime, and whom I have known to be seized with an incurable hemiplegia, especially if they sleep with a large fire in the room, perceive any obstruction in the respiration while that destructive vapour violently hurts the functions of the brain. Likewise those who are killed by the vapour of charcoal in a close place, and are thought to be suffocated by the respiration being stopt, seem to perceive the first bad effect in the head; although that vapour is so virulent, that soon after it likewise destroys

ⁿ De Lithiasi, cap. 9. sect. 73. p. 725. ^o Ibidem, sect. 48. p. 719.

stroy the vital functions, by bringing on a mortal syncope. For when either that vapour is not so thick in the place where the persons are, or when they stay there only for a short space, then they complain of a violent pain in the head, which feels as if the skull would fly in pieces from too great distension: but if they remain longer in such a place, full of the vapour of burning charcoal, they are rendered stupid, quite senseless, and die. Whence the celebrated Hoffman^p says, by this poisonous vapour unwary persons are rendered stupid and apoplectic. But such as are killed by it, are found in the same posture which they were in when the vapour first affected them. There is a remarkable case in Wepfer, which confirms what has just now been said^q. Two men sat up all night in a small chamber, with rather a low roof, where there was a digestory furnace, commonly called *piger Henricus*, “slow Henry;” and in the morning they were both found dead. One of them kneeling upon a wooden log, leaning with his hands folded upon the rest of the window, through which he had been looking watchful, resembled a person buried in a sound sleep. The other lay flat on his back upon the ground, and seemed as if he had fallen while he was attempting to get out. But the former, a week before that, had remained about an hour in the same place; and upon coming into the open air, he began to stagger, and afterwards fell into so sound a sleep, attended with snoring, that he could hardly be awaked. But after he was brought to himself again, by means of cold water thrown upon his face and breast, he imagined that he had just awaked from a very pleasant sleep, and felt no kind of anxiety. Neither does Helmont^r, in relating the accident which happened to himself, make mention of any anxiety; but that he felt an immediate sensation of fainting about the orifice of his stomach; and upon going out of his study, which was infected with the vapour of the charcoal, he immediately fell down, and

^p Observat. Chémico-Physic. lib. iii. obs. 13. p. 329. ^q Observat. Pract. de Affect. Capitis, p. 360. ^r De Lithiasi, cap. 2. sect. 54. p. 720. et Jus duumviratus, p. 242. sect. 19.

and hit the back-part of his head violently on the pavement: he lost the sense of taste and smell entirely, had a ringing in his ears, and a swimming in his head remained for some months. But these symptoms might likewise be owing to the violent contusion of the back part of his head. In the mean while, however, it seems plain, from what has been said, that the vapour of burning charcoal must be hurtful rather to the head, than to the lungs. But the bad effects of houses fresh plastered, and likewise of the vapour of charcoal, was observed formerly by Galen^s. However, if at the same time we consider, that charcoal leaves but very few ashes, and that almost the whole substance of it being dissolved into vapour is dispersed in air, we may understand how even a small quantity of it (as happened to Helmont) in a small close chamber, may produce the worst effects; especially in cold weather, when the vapours are less dissipated, and more condensed.

§. 1011. **W**E have arrived at the knowledge of those causes (1010.) by the anatomical inspection of the bodies of persons who have died of the apoplexy, and the historical account of observations made in treating those patients. When considered, they are easily reduced to the above classes (1010.) very proper to assist us in finding out a cure.

Those causes of the apoplexy, above related and explained, have either been discovered by inspecting the bodies of persons who died of this disease; or it has appeared from repeated observations, what things applied to the body have produced this disease, and therefore might be justly looked upon as causes of it. All these have been confirmed by the testimonies of the best authors; to which if any one desires to add more, he will easily find them in Bonetus's *Sepulchretum Anatomicum*. But order required, that the causes of this disease, being so numerous, should be distributed into certain

^s De usu partium lib. vii. cap. 8. Charter. Tom. IV. p. 458.

certain classes, that thereby a proper cure might be the better applied to each. For as it will appear afterwards, those remedies which in one species of apoplexy are justly commended as being most effectual, in another species of the same disease would be extremely hurtful.

§. 1012. **I**T appears from the same circumstances, that this disease is frequently produced from different, and indeed very opposite, causes; and therefore that it has been properly enough divided into sanguineous and pituitous: but this division is not quite perfect; seeing there are, besides, the serous, the atrabiliary, the polypous, and others.

The immediate cause is the same in all apoplexies: but the remote ones are frequently very different; whence there can be no universal method of curing this disease. For if the animal functions are abolished by an inert phlegmatic lentor of the blood, whereby it is rendered unfit to circulate freely through the vessels of the brain, and serve for the secretion of the spirits; then that method of cure alone is proper which attenuates this lentor, gives a due consistence to the blood, and quickens its too languid motion. But if the blood, from an inflammatory thickness, is obstructed near the extremities of the vessels; then there is required quite an opposite method of cure, whereby the blood may be dissolved, and the too great motion of the humours moderated. Hence arose that general division of the apoplexy, into *hot* and *cold*, or *sanguineous* and *pituitous*; and to those two distinct heads the whole cure used formerly to be adapted. But from enumerating the causes, this division plainly appears to be deficient, neither can all the causes of the apoplexy be reduced to those two heads.

§. 1013. **T**HE part affected in a *perfect apoplexy* is the whole common sensory;

fory; but in the *parapoplexia* only a portion of the sensory, the other parts of it being in some measure compressed, but in a less degree: The cerebellum, for the most part, remaining unhurt in the beginning of the disease.

As, in the perfect apoplexy, all the senses both internal and external, and all the voluntary motions, are abolished, (see §. 1008.), the part affected ought to be that, from which all the nerves, destined for the senses and voluntary motions, take their origin, and to which part the impressions made upon those nerves, being conveyed, produce ideas, affections of the mind, motions of the body, &c. But that part, which ever it is, physicians have called the *common sensory*; in which the mutability of the thoughts depends upon a change of the body, and *vice versa* the mutability of the body upon a change of the thoughts. But that cause, by which the common sensory is affected, may remain lodged in some other part of the body, as appeared in enumerating the causes of the apoplexy; concerning which, you may likewise see what was said in the comment to §. 701. But since, though the voluntary motions and senses are abolished, there still remain several other motions, which are performed without our being conscious of them; the function of that part, therefore, upon which those motions depend, ought to remain entire: now that part was believed to be the *cerebellum*, upon which see what has been said in the comment to §. 1009.

In the perfect apoplexy, as was said before, the senses and voluntary motions are altogether abolished. But sometimes it happens, that such patients appear to be in some measure affected by very powerful causes acting upon the organs of the senses; in some parts there yet remains a slight attempt to motion; they still swallow down what is put into the mouth: In this case, therefore, the functions of the common sensory are very much hurt, but not quite abolished; and therefore this is as it were a slight degree of the same disease, which hence may be properly called a

para-

parapoplexia; as the gentler species of the quinsy is called by Hippocrates, *paracynanche*, (see §. 783.) In the mean time I do not remember to have found the name *parapoplexia* amongst the ancient authors.

§. 1014. **W**HENCE it appears, Why the pulse and respiration are continued, while the senses and voluntary motions are abolished: Nay, why the pulse and respiration frequently increase, in proportion as the senses and voluntary motions decrease; as also upon the approach of death.

Because in the apoplexy that part of the brain is obstructed which is appropriated for the exercise of the animal functions, whilst the other which serves for the vital motions still remains free. But as the action of the whole brain, both as to the animal functions, and the rest, depends upon the free motion of the fluids through the vessels which compose its substance, it appears sufficiently plain, that a free passage through a great number of these vessels being hindered, the others must be more acted upon by the fluids which are sent to them: But the quantity of any secreted liquid is increased, *c. p.* when a greater quantity of fluids is applied to the secreting organs within a given time; which as it happens to be the case in the apoplexy in that part of the brain which serves for the vital motions, the reason appears, why the pulse and the respiration increase, while the senses and voluntary motions decrease. Nay, we observe this also during the time of natural sleep, in which the animal actions and voluntary motions likewise cease: for the respiration is fuller, stronger, slower, and more equable, and the motion of the heart and arteries too is observed to increase in strength: whence also all the actions, which do not depend upon our will, are best carried on in the time of sleep; *viz.* the circulation, the concoction of the crude humours, the distribution of the fluids, nutrition, &c. But as in other diseases

eases a strong and equable respiration is so good a sign, especially if the pulse is strong at the same time, and an equal heat extends to the very extremities of the body; therefore persons who are less skilful can hardly believe, that a patient in the apoplexy is in such danger, while they observe the vital actions to be so strong. But as the same cause, which hindered the animal actions, continues to act, or is increased; in a short time the vital actions, which were so strong but a little before, are likewise oppressed, and death suddenly follows.

§. 1015. **T**HE violence of the apoplexy therefore is judged from the age, constitution, and make of the patient, from the urgency of the symptoms, and especially the entire abolition of the senses and motions; from the respiration being very strong, with a profound snoring; from there being a plentiful viscid foam about the mouth, and a thin sweat standing upon the body in drops and somewhat cold; and from its being produced from a preceding *parapoplexia* which was at first gentle, from a violent epilepsy having gone before, or from some more vehement known cause.

All physicians acknowledge the apoplexy to be always dangerous: hence we treat here only of the greater or lesser degree of danger; which is known,

From the age.] Thus, for example, old persons, who are seized with this disease, do not so often recover; because for the most part in them an inert glutinous matter is collected in the cavities of the brain, and by the very effects of old age that morbid quality of the blood is daily increased, as was said in the comment to §. 1010. No II. 3.

The constitution.] Thus an atrabiliary constitution increases the danger of this disease; because either the blood by its pitchy tenacity begins to stick in the ves-

fels of the brain (see §. 1010. N^o II. 3.); or the atrabiliary matter being received into the circulation, and rendered acrid, very quickly destroys every thing (see §. 1010. N^o IV.) without any hopes of a cure. But altho' this atrabiliary matter should only be hurtful in regard of its tenacity, yet it would be a very difficult task to resolve it.

The make of the patient.] The head (for example) large, the neck short, great corpulence, &c. of which we treated in the comment to §. 1010, N^o I.

The violence of the symptoms, &c.] For thereby is known the greatness of the cause which produced the apoplexy: of this we treated in the comment to §. 1008.

A foam about the mouth, &c.] For while the free passage of the blood through the vessels of the brain is hindered, so much the more are the branches of the external carotid filled: hence the face appears so much puffed up; and a greater quantity of saliva, and that more viscid, is secreted; which persons, who labour under a strong apoplexy, neither feel to be accumulated, nor swallow; whence it is collected more and more, and by the strong and quick respiration becomes foamy. See likewise what was said upon this foam in the comment to §. 1010. N^o III. 4.

A thin sweat, &c.] It appeared in the history of Fevers, in the comment to §. 594, n^o 2. that the morbid matter being concocted, and rendered moveable, was sometimes happily expelled out of the body in form of sweat: but at the same time it was observed, that such sweats broke out equally over the whole body, that they were warm, and exhaled from the skin in the form of a vapour; for then they denote the vital powers to be strong, the concocted matter to be moveable, and the vessels pervious. Whence likewise such sweats are commended as good in an apoplexy, in the comment to §. 1017. But other sweats appear in diseases as a very bad symptom, viz. while they are sparing, and stand collected in drops upon the skin: and then they are almost always cold and subviscid; and denote, upon the approach of death, that the extremities of the

cutaneous vessels are relaxed, so as to transmit that thick and viscid sweat; and at the same time that the vital powers are so much weakened, that they cannot propagate a powerful enough heat to the surface of the skin, whereby the sweat might be resolved into a vapour. At the same time the face, to which the drops of sweat adhere, is usually red; concerning which you may see what was said in the comment to §. 741, where the prognostic signs in an Ardent Fever are treated of. But as soon as that cause which produced the apoplexy begins likewise to obstruct that part of the brain upon which the vital actions depend; then the respiration is likewise rendered more difficult: and from this symptom attending them has Hippocrates condemned sweats in this disease, saying, *In apoplecticis, ex spiritus molestia sudor accedens, lethale;* “ In apoplectic persons, “ a sweat arising from laborious respiration is a mortal symptom^a.” Cœlius Aurelianus has likewise joined these two symptoms together, where he has described the apoplexy growing worse, *Pejorante passione atque in exitum agrorum crescente, vultus adductio, ita ut longior nota videatur imago* (ob musculos faciei paralyticos, et maxillam inferiorem proprio pondere pendulam), *præcordiorum prominentia, atque totius corporis frigidus torpor, pectoris stridor, et superiorum partium sudores frigidi;* “ The disease growing worse, “ and tending to the destruction of the patient, the “ face appears lengthened (*on account of its muscles “ being paralytic, and the lower jaw falling down by its “ proper weight*), the chest prominent, and a cold “ numbness seizes the whole body, a rattling is heard “ in the chest, and cold sweats appear on the upper “ part of the body^b.”

Produced from a parapoplexia, &c.] For as this is a gentler degree of the apoplexy, (as was said in the comment to §. 1013.); so if an apoplexy follows, we know the cause of the disease to be increased. But this for the most part happens from an extravasated liquid gradually increased in quantity: As for example,

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^a Coac. Prænot. n^o 479. Charter. Tom. VIII. p. 880. ^b Acuter. Morbor. lib. iii. cap. 5. p. 199.

if a small artery in the brain, being broke, pours out its blood, the functions of the brain will thereby be disturbed; and the symptoms will increase in proportion to the quantity of extravasated blood, till at last the whole common sensory becomes affected; and so an apoplexy follows. Now, if the disease, when it was gentler, could not be overcome; it is plain enough that there can remain but little hopes of curing it after it is become worse.

From an epilepsy, &c.] It will appear afterwards, where we treat of this terrible disease, that, by such violent, and frequently repeated convulsions, the brain must often be so much hurt, that an apoplexy, and death, will certainly follow: but it is evident, that in this case there can be no hope. In the mean time it must be observed, that most frequently in the end of an epileptic paroxysm they sleep with a snoring noise, and soon after they come to themselves again. But when that profound sleep which usually ends a paroxysm, is protracted longer than common, then there is great reason to be afraid that the epilepsy has passed into a fatal apoplexy.

Or from some more vehement known cause.] Such a one, *viz.* as immediately destroys the brain; for example, if the atrabiliary matter resolved, moved, and rendered very acrid, should be determined to the head. Or if the cause is such, that it can neither be removed by art, nor considerably diminished: Thus, for example, if a pound of extravasated blood should be collected in the ventricles of the brain, and about the basis of the cranium, there would be no hope that such a quantity of blood should be quickly enough resorbed again by the veins; neither, if the skull was trepanned, could the extravasated blood be removed, seeing it is lodged too deep. For this reason, wounds below the orbit of the eye, the bones of the temples, the ethmoid bone, the basis of the cranium, &c. are reckoned mortal; upon which see §. 170, no 1.

§. 1016. **O**N the contrary, this disease is judged

ged to be gentle and curable, from the slightness of the symptoms, and the absence of those mentioned at §. 1015.

The truth of this assertion is very obvious: in the mean time I must observe, that great caution is required here in the physician, lest he should err in this prognostic to the prejudice of his character.

For since (as was said in the preceding paragraph) an apoplexy, and even a fatal one, sometimes immediately follows a weak parapoplexia; a physician who is called at the time, while the patient labours under the parapoplexia only, might be apt to conclude from the slightness of the symptoms that the disease was curable, and foretel an happy event; while a violent apoplexy might unexpectedly kill the patient in a few hours after, *viz.* from the cause which produced the parapoplexia being increased. Wherefore the physician ought always to forewarn the persons concerned, that there is even great danger in the slightest kind of apoplexy; constantly keeping in his mind that observation of Hippocrates, (see §. 1010, N^o IV.) *viz.* that even a gentle apoplexy is difficult to cure, but a violent one is hardly ever cured: and at the same time it appears, that a gentle apoplexy frequently terminates in a violent one.

§. 1017. **A** GENTLE apoplexy is resolved by a profuse, equable, dewy, warm, relieving sweat coming on; by a plentiful discharge of thick urine; by the hæmorrhoids flowing copiously, and for a long time; by the return of the menstrual evacuation; by a flux; or by a strong fever.

It has already been frequently observed (see §. 885.) in the history of acute diseases, that they were cured by the assistance of nature, or of art. At the same time it was remarked, that a knowledge, by careful observations, of those attempts which nature makes to

carry off diseases, and by which the so frequently succeeds, must be of the greatest service in the cure of diseases: For thus the physician is rendered cautious not to disturb those attempts by an imprudent method of cure; and at the same time he learns to imitate them by art, where they do not appear of their own accord. But the cure of the apoplexy, to be afterwards explained, will teach us, that art attempts to produce the very same effects which were observed to be of service when they appeared of their own accord, either by evacuating, or diverting the force and quantity of blood from the head, or by resolving and carrying off the stagnating fluid. We shall now consider each of these singly; but first I must observe, how an apoplexy may be said to be *resolved*. It appears from what was said in the comments to §. 594. §. 830, n^o 1. and §. 887, that a favourable resolution of diseases might then be said to happen, when the morbid matter, *without* any sensible evacuation, is so changed, as that health is restored: but here are enumerated *sensible* evacuations. But the apoplexy is said to be *resolved*, when it is *cured*, according to Hippocrates's phrase, who has used the word *λυειν* in this sense, in the same disease^a.

By a plentiful sweat, &c.] That morbid humours may be expelled out of the body by sweats, was explained at large in the comment to §. 594; and at the same time those properties were observed with which such salutiferous sweats ought to be endowed that they may be distinguished from such as are symptomatical and hurtful; and then too it was remarked, that a sensible relief was the most infallible sign of a salutary evacuation. It will appear afterwards, when we come to treat of the Dropsy, that lymph accumulated in the cavities of the body may be carried off by sweat: but a gentle apoplexy, of which only we treat at present, sometimes owes its origin to such a cause (see §. 110. N. II. 3.), and therefore may likewise be cured in the same manner; and it is chiefly in this case that such sweats seem to be of service.

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^a Aphor. 42. sect. ii. Charter. Tom. IX. p. 81.

A plentiful discharge of thick urine.] It appeared in the comment to §. 830, n^o 4. and §. 888, n^o 2. that inflammatory matter, resolved, and rendered moveable, but nevertheless degenerating from the qualities of a sound humour, is sometimes expelled out of the body by the urinary passages. But at the same time it is observed, that this evacuation was frequently joined with others, if the disease was violent; and was seldom sufficient alone, unless the case was slight: But as here we treat of a gentle apoplexy; and in §. 1010. N^o II. 2. an inflammatory thickness of the blood is reckoned amongst the causes of the apoplexy; it appears that this disease may be cured by such urine as is above-mentioned.

By the hæmorrhoids, &c.] That too great a quantity of good blood, by over-distending the blood-vessels of the brain, may produce an apoplexy, appeared at §. 1010. N^o I. N^o III. 1. and N^o IV.; therefore, whatever lessens the quantity of blood is useful in curing an apoplexy produced from this cause: but the hæmorrhoids flowing copiously are most serviceable in this case, because they most effectually divert the force and quantity of the blood from the head, seeing the blood is moved almost in an opposite direction thro' the hæmorrhoidal vessels to that which it has through the carotid and vertebral arteries. Hence Hippocrates^b has observed, that the hæmorrhoids are serviceable to apoplectic persons; as was remarked upon another occasion in the comment to §. 702: and likewise in the Frenzy (see §. 779.), and in Madness^c, they have a very great effect. Besides, daily observations teach us, that such as are accustomed to this evacuation, suffer various complaints of the head, such as head-ach, giddiness, and noise of the ears, if the hæmorrhoids are obstructed: which Hippocrates has likewise remarked saying, *A giddiness arising from the hæmorrhoids flowing too sparingly prognosticates a slight apoplexy approaching, which is cured by bleeding; and every*

^b Coac. Prænot. n^o 478. Charter. Tom. VIII. p. 880.

^c Aphor. 21. sect. vi. Charter. Tom. IX. p. 260.

every appearance of this kind foretels something bad^d. As therefore, from the hæmorrhoids being suppressed, diseases of the head follow; and on the contrary, upon that evacuation returning, those diseases are removed; it is sufficiently obvious, that great service may thence be expected in an apoplexy which arises from too great fullness of the vessels of the brain; for when the vessels are broke, a violent apoplexy is produced from the extravasated blood, in which case there remain but small hopes of a cure. Farther, the melancholic humour likewise was reckoned amongst the causes of the apoplexy §. 1010. N^o II. 3. which is conveniently evacuated by the hæmorrhoidal discharges, as will appear afterwards in the comment to §. 1110.; and therefore the hæmorrhoids are useful in likewise producing this effect.

By the return of the menstrual evacuation.] As in women the body is so formed by the wise Creator as to contain and nourish the human infant within it, a woman in health generates a greater quantity of good blood than is requisite for the nourishment of her own person; and therefore the superfluous quantity is carried off by the menstrual discharge: if, then, this evacuation should happen to be stopt, a plethora will be produced, and the vessels will be distended with a greater quantity of blood, unless that which is superfluous is sent off by some other emunctories; and thus a suppression of the menses may occasion an apoplexy. For practical observations teach us, that the vessels in the head are chiefly affected by this plethora, while those of the uterus too much resist the blood to be evacuated at the usual time. Hence Hippocrates ^e observes, that violent complaints of the head, and a noise of the ears, precede the eruption of the menses; and that it comes on if a sense of heat follows near the spine, which denotes that the branches of the descending aorta begin to be more distended with blood. And else-

^d Ex hæmorrhoidæ parum apparente vertigines obortæ parvâ siderationem brevî futuram significat (παράπληγικον μικρον, & επ'ολιγον solvit venæ sectio; et quidquid hoc modo apparuerit, mali aliquid significat. Coac. Prænot. n^o 346. Charter. Tom. VIII. p. 871.

^e Coac. Prænot. n^o 168. Charter. Tom. VIII. p. 861.

elsewhere ^f he says, that shiverings, weariness, and pains in the head, are felt upon the eruption of the menses. Now all these symptoms teach us, that the vessels of the head are at that time too much distended; nay, and sometimes burst: wherefore Hippocrates ^g speaks in praise of an hæmorrhage of the nose, when the menstrua are obstructed. If therefore an apoplexy arises, from the vessels of the head being distended by the suppression of the menses, the return of that discharge will be of service, both by evacuating, and diverting the blood from the head; seeing the vessels of the uterus propel the blood in an opposite direction to that which is sent to the head, the same as the hæmorrhoidal vessels.

By a flux.] A flux may be of service in the apoplexy two ways; either as it evacuates part of the morbid matter, or as it diverts the force and quantity of the humours from the head downwards: for as, by the humours being evacuated by stool, the vessels of the abdominal viscera are emptied, and thus make less resistance to the blood which is sent thither; hence a powerful revulsion is made from the upper parts of the body, as was proved at large in the comment to § 779, where we treated of the Cure of the Frenzy. But the evacuation itself may likewise be very serviceable. So in the comment to §. 720, it is mentioned, from an observation of Hippocrates, that if a violent diarrhœa succeeds in a person afflicted with white phlegm, it terminates the disease. Now such a pituitous and inert indisposition of the blood as is observed in leucophlegmatic persons, is reckoned amongst the causes of the apoplexy, §. 1010. N^o II. 3. and therefore may be cured by a looseness.

Farther, it appears, from what was said, in the comment to §. 1010. N^o V. that the cause which produces the apoplexy sometimes resides in the stomach; which therefore may be expelled by stool, as well as by vomit. I knew such a case to happen to a person of distinction; who, being in company with some of his

^f Ibid. n^o 541, 548. Ibid. p. 885. ^g Aphor. 33. sect. v. Charter.
Tom. IX. p. 214.

his friends, began of a sudden to look wild, presently after was struck speechless, and fell down apoplectic. While some of the most skilful physicians, who were called to him, believed the case to be quite desperate; after a quarter of an hour, without any remedy, besides bleeding, he vomited, besides the aliments contained in his stomach, a great quantity of phlegm, so large that the human stomach would hardly be thought capable of containing it. Immediately after, the senses and motions returned; and, being refreshed with a pleasant sleep, he was perfectly recovered the day following; and laughed at the hurry his heirs were in to visit him, upon the message being sent to them. Hence it appears, that such phlegm, loading the primæ viæ, may produce an apoplexy; but that it is easily curable, the cause being removed by vomit or stool. Helmont has observed this surprising effect, whereby the stomach when it is over-loaded disturbs the functions of the brain, saying, “ But if there
 “ should be collected a rank phlegm, tending to a
 “ bitter quality, it will occasion a vertigo; and, if
 “ the cause is increased, an apoplexy^a.

From a strong fever.] It appeared from what was said before in the history of Fevers, that a fever is sometimes a cure for a great many other and very obstinate diseases, (see §. 558.); and this was plainly proved, when we treated of the effects of a fever, (in the comment to §. 587.). For then it appeared, that by a fever the stagnating fluids were put in motion, such as resisted the vital powers were subdued, and the crude changed into concocted, &c. From which it may be concluded, that some causes of the apoplexy may be corrected, or even removed, by the strong force of a fever. Indeed it is very evident, that a fever cannot be of service in all the causes of the apoplexy abovementioned: for if it arises from a plethora, or humours extravasated from ruptured vessels, a fever will increase it. But the cure of this disease by a fever seems then especially to be hoped for, when a phlegmatic inert indisposition of the blood has produced the

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^a In Capit. *A sede animæ ad morbos*, sect. 12. p. 236.

apoplexy (§. 110. N^o II. 3.); for such morbid matter may be resolved by the fever, and expelled from the parts where it stagnates, as was proved more at large in the comment to §. 587. Besides, the blood, when it is obstructed in the vessels from an inflammatory lentor, may be so changed by a fever, as to be rendered fit to pass through them, (as appeared from what was said concerning Acute and Inflammatory Diseases); and then frequently, towards the crisis, the morbid matter being rendered moveable, a new fever arises, or the present one is increased, by which the symptoms of the disease are relieved. In that surprising case of the young woman who was recovered to life after she was hanged (see the comment to §. 1010. N^o III. 4.) it deserves to be remarked, that the most skilful physicians, who were employed in that case, used hot spirituous medicines, anointed the neck, temples, and soles of the feet with hot oils and spirits, and injected aromatic decoctions by way of glisters: whence, the day following, a fever arose; and at the same time the senses and speech returnedⁱ, the blood which had stagnated in the vessels of the brain while she hung in the rope being moved and propelled. It is certain that the ancients expected the cure of an apoplexy from a fever, provided it was curable. Thus in Hippocrates we have the following remarks: *A sudden head-ach seizes a person who was before in health; immediately he loses his speech, snores, and gapes; if he is called upon or shook, he only groans, is quite insensible, and makes water involuntarily in great plenty. Such a person, unless he is taken with a fever, dies in seven days; but if a fever seizes him, for the most part he recovers*^k. Where it is to be observed, that this is meant only of a gentle apoplexy, because the patient groans while he is shook or called upon by the
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ⁱ Wepferi Hist. Apoplect. p. 168, &c.

^k Derepente sanum capitis dolor prehendit, confestimque obmutescit, et stertit, et os hiat; et si quis eum vocet, aut agitet, solum ingemiscit, nihil autem intelligit, et copiose mejit, et se ad mictum non incitat. Hic nisi eum febris corripuerit, intra septem dies moritur; quod si corripuerit, plerumque sanus evadit. *De Morbis, cap. 7. Charter. Tom. VII. p. 558.*

by-standers; and therefore some remains of the senses are still left, although they are but weak. Farther, that kind of apoplexy which we now speak of, seems to owe its rise to a cold and slow cause, because he immediately adds: *But this kind of disease happens more frequently to old persons than to those who are young*^l. But he likewise expected great service from a fever in another species of apoplexy; for we read in the same place: *But when a person loses his speech from hard drinking, if he is immediately seized with a fever, he recovers; but if he is not seized, he dies in three days*^m. Nay farther, when that bad kind of sweat (concerning which see §. 1015.) appears, with a difficulty of breathing which is reckoned a mortal symptom, he subjoins, *But again, even in these, if a fever comes on, the disease is cured*ⁿ. Aretæus^o likewise, after ordering a sharp clyster to be injected in a cold apoplexy, observes, that there is hope of recovery if the patient is seized with a fever. But it appears also from Hippocrates^p, that he only expected a salutary effect in an apoplexy from a pretty strong fever, raised by the force of the contending vis vitæ; but not from a slow fever, where the vital powers are depressed. This seems to be the sense of that prognostic of Hippocrates; an aphorism similar to which we read in the *Prorrhætica*^q, which Galen explains thus: *That a weak and slow fever, not an acute and hot one, coming upon an apoplexy would be of no service*^r.

But it was said in §. 1014, “ That the pulse and respiration increase in proportion as the senses and voluntary motions decrease, as likewise at the approach

^l Hujusmodi autem morbus senioribus contingit magis quam junioribus. *Ibid.*

^m At si quis ex temulentia voce deficiat, si quidem jam confestim eum febris corripiat, conualecit; nisi vero corripuerit, intra triduum moritur. *Ibid.*

ⁿ Rursus autem in his ipsis, si febris accedat, solutio fit. *Coac. Prænot. n° 479. Charter. Tom. VIII. p. 880.*

^o De Curat. Morbor. Acut. lib. i. cap. 4. p. 82.

^p *Coac. Prænot. n° 480. Charter. Tom. VIII. p. 880.*

^q Lib. i. textu 84. *ibid.* p. 752.

^r Quod abortivæ apoplexiæ, non acuta et calida, sed debilis et diuturna subsequuta febris nihil profuerit. *Ibid.* p. 753.

“proach of death;” and therefore a person might be deceived, by mistaking that increase of the pulse depending upon the disease gaining force, for a salutary fever capable of curing the apoplexy. But where an apoplexy is mortal, as the disease proceeds the respiration becomes higher and more snoring, and all the animal-functions are absolutely abolished: Whereas, on the other hand, when such a strong salutary fever arises, the respiration is rendered more free, and slight symptoms at least appear of the animal-functions recovering.

§. 1018. **W**HEN this disease is somewhat more violent, the cause being overcome, it usually changes into a palsy of some muscular part; either of one side entirely, whence an Hemiplegia; or of all the parts below the neck, whence it is called Paraplegia: which is seldom cured; and always leaves behind it a defect in the memory, judgment, and motions of the body; whence the persons usually remain sleepy, dull, paralytic, giddy, and timid.

This termination of an apoplexy which is not mortal, is observed to happen by far the most frequently. All practical physicians know very well, how seldom patients recover of the apoplexy without any hurt of the animal-functions remaining. Whence Celsus has very well said, *It is usual for those who are taken with an universal palsy, to be suddenly taken off; or if they are not taken off, they live longer indeed, but seldom quite recover; and for the most part lead but a miserable life, being likewise deprived of their memory*^a. Nay, Coelius Aurelianus, amongst the signs which distinguish the epilepsy from the apoplexy, places the following, “That epileptic patients frequently recover quite af-
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^a Solent autem qui per omnia membra vehementer resoluti sunt, celeriter rapi: ac si correpti non sunt, diutius quidem vivunt; sed raro ad sanitatem perveniunt; et plerumque miserum spiritum trahunt, memoria quoque amissa. *Lib. iii. cap. 27. p. 178.*

“ter they have been seized; but such as are apoplectic
 “suffer a palsy afterwards ^b.” I have seen several
 persons, who, after having been cured of an apoplexy,
 exercised all the functions of the brain perfectly well;
 and were only deficient in this, that they could not
 find words to express their meaning; and would at-
 tempt to explain themselves by signs with their hands,
 feet, and gestures of the whole body, but without ef-
 fect. That complaint frequently remains incurable
 for several years. But, likewise, people recovering
 from an apoplexy are frequently changed in a surpris-
 ing manner as to the affections of the mind; so that I
 have seen that masculine strength of mind so enervated
 in persons remarkable for good sense, and the bravest
 soldiers, that they would cry like a child upon the
 slightest occasion. Hence Aurelianus has very just-
 ly observed, “That in some the brain is a little turn-
 “ed, so that they become either foolish, or melan-
 “choly, and sleepy, speaking incoherently as if they
 “were just waked out of a sleep ^c.” The wise Mal-
 pighius, who had suffered the pains of the stone and
 gout, and various misfortunes, with great fortitude,
 after being cured of an apoplexy, and a palsy of the
 whole right side, found a great defect in his memory
 and judgment, and the slightest trifle would set him a-
 crying ^d. Hence it seems to appear, that certain func-
 tions of the brain remain disturbed, or even abolished,
 ever after, because by the preceding apoplexy there
 has been something changed in the common sensory.
 Whence at the same time it appears, what a variety of
 complaints may follow an apoplexy, while the animal-
 functions remain hurt in any particular part of the
 body, or in several at the same time. But these dis-
 eases which either hurt, or entirely destroy, the ex-
 ercise of muscular motion, depending upon the will,
 physicians have denominated by various appellations.
 When the voluntary motions cease in all the parts be-
 low the neck, it is usual now, by the unanimous con-
 sent of the physical schools, to call it a *paraplegia*.
 But

^b Acutor. Morbor. lib. iii. cap. 5. p. 201.

^c Ibid. p. 200.

^d Baglivi Opera Omnia, p. 681.

But in the mean time it appears, that the word paraplegia was understood in a different sense by the ancient physicians. Thus Galen ^e certifies, that *Hippocrates vocat paraplegias, illas paralyses quæ ex apoplexia in partem quandam decumbunt*; “Hippocrates calls a *paraplegia*, that kind of palsy which falls upon a certain part after an apoplexy:” and therefore he must have denominated all hurts of the animal-functions, remaining after an apoplexy, by the general name of *paraplegia*. But Aretæus ^f, after he has said, that the apoplexy, paraplegia, the paresis, and palsy, are all of the same kind, adds the following: *Paraplegia autem (est) tactus motusque remissio, sed in membro uno, utpote manu vel crure*; “But a paraplegia (is) a loss of feeling and motion, but only in one member, for example the hand or leg:” and he has distinguished it from a palsy, because in this for the most part there is only a defect of motion and action. Soon after he remarks, that by the name paraplegia Hippocrates understood a particular apoplexy: *Quod enim in toto corpore est vehemens apoplexia, illud in crure paraplegiam vocat*; “For that which in the whole body is a violent apoplexy, in the leg is called a *paraplegia*.” It appears therefore, that the ancients called that a *paraplegia*, which we at present call a *palsy*: for in this likewise the feeling is sometimes quite lost together with the motion, as will be said afterwards in the comment to §. 1057; and is a disease of a particular part, but not of the whole body. But when one half of the body is deprived of voluntary motion, then it is called an *hemiplegia*; though Galen ^g has comprehended this disease likewise under the general name of *palsy*.

It was demonstrated by several observations, upon another occasion, in the comment to §. 276, while in the history of Wounds of the Head we treated of the symptoms which point out the place that is hurt within the skull, That that corporeal organ, which is the

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^e Comment 2. in lib. ii. Epidem. Charter. Tom. IX. p. 130.

^f Morbor. Diuturn. lib. i. cap. 7. p. 33. ^g De Locis Affectis, lib. iii. cap. 14. Charter. Tom. VII. p. 449.

spring of sense and voluntary motion in us, seems to be double, both in its origin, collection, distribution, and operation: whence one part of it may remain sound, while the other is rendered quite unfit for every thing. But that is evidently the case in the hemiplegia; in which, if it is perfect, one half of the body from the head to the foot is rendered paralytic. Thus I have seen persons who could only wrinkle one side of his forehead, while the other being paralytic remained smooth: neither could they contract the orbicular muscle of the eye-lid on that side, nor hinder the buccinator from letting the food get in between the paralytic cheek and the teeth: if the tongue was thrust out, they drew it in again towards the sound side; and on the same side the angle of the lips was drawn upwards, on account of the muscles on the other side being paralytic: they stammered very much, one side of the tongue being deprived of motion; and hence likewise, when chewing, the meat would drop out of their mouth. Upon observing such effects as these, Aretæus^b imagined that the internal parts likewise, viz. the stomach, intestines, &c. retained only one half of their strength. In the mean time this does not seem always to hold true in hemiplectic patients: for I have seen several, who were much more voracious than before the disease happened; they digested what they eat very well, and went regularly to stool; and thus for several years they lived hemiplectic, but otherwise in good health. Aretæus likewise in the same place has ingeniously observed that decussated action of the brain, by which an hurt in the right side of that organ occasions an apoplexy in the left, and *vice versa*; on which see what was said in the comment to §. 276.

But the reason why an apoplexy, when it is somewhat violent, is seldom entirely cured, but almost always leaves the animal-functions in some measure hurt, appears sufficiently from the known structure of the brain. It is proved in physiology, that these vessels, by which the cause of muscular motion is con-

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^b In loco modo citato.

veyed to the muscles, and upon which depend the action of the internal and external senses, are the smallest and at the same time the most tender of the whole body. Hence if the cause of the disease should act by compression, for example, upon the soft and pulpy substance of the brain, several of those very slender stamina may remain destroyed during life ever after, although the cause itself should afterwards be removed. Besides, if that very subtle fluid is hindered for some time to flow through these slender nervous stamina, the delicate sides of those vessels will collapse, and in a short time grow together; in which case that function, which depended upon the perviousness of those vessels, will remain incurably hurt during life, although the cause which produced the apoplexy should be entirely removed. But this we shall speak of afterwards, when we come to treat of the palsy.

§. 1019. **T**HE perfect apoplexy (§. 1015.), by the cerebellum being eroded, the fluids corrupted, and the cause propagated to the cerebellum, terminates quickly in death, very seldom later than the seventh day.

It appeared from what was said in the comment to §. 1009. that there are two distinct parts in the brain; one of which serves for the senses and voluntary motions; the other for the vital and spontaneous, which are not subject to the command of the will. In the apoplexy, the vital motions indeed remain: but often, in a short time, that cause which had abolished all the animal functions, likewise destroys the vital; altho' practical observations seem to teach us, that that part of the brain, which ever it is, upon which the vital functions depend (see §. 1009.), is not so easily hurt as the other. But if extravasated humours, for example, should continue to be increased in quantity, in a short time all the parts within the cranium will be compressed. The same consequences ought to follow, if

the extravasated humours, being corrupted, and rendered acrid, should by corroding destroy the soft and pulpy substance of the brain. Further, if we suppose that another cause, *viz.* an obstruction of a great number of the vessels of the brain, has given origin to the apoplexy; in a short time the disease will be propagated to that part upon which the vital functions depend; because the heart continues to propel the humours through the carotid and vertebral arteries; and therefore those vessels which were hitherto free and pervious will be so much the more distended, and, being extremely delicate, will suddenly be destroyed. This is the reason, why a perfect apoplexy, of which only we treat at present, is so quickly fatal, so as frequently to be mortal in a few hours; and very seldom, or never, to exceed seven days; as appears from those passages of Hippocrates, which were mentioned in the comment to §. 1017.

§. 1020. **A** FUTURE apoplexy may be foreseen, 1. From the natural constitution, (1010. N^o I.) 2. From the morbid matter being known as the predisponent cause, (1010. N^o II. III.) 3. From the procatartie causes. 4. From the first effects of the beginning disease; such as, trembling, sudden weakness, vertigo, scotomia, numbness, sleepiness, a failing of the memory, a ringing of the ears, an inflation of the face and neck, &c. the respiration fuller than usual, with the nostrils compressed; and from the incubus.

Seeing therefore it is so difficult to cure the apoplexy, it is worth while to know the signs by which we can foresee its coming, so as it may be prevented before it is formed. Of these we come now to treat.

1.] Of these we treated in the place above quoted.

2.] Of these we treated likewise. These last alone, at least not all of them, do not constitute the

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apoplexy; but occasion such a predisposition in the person, as, upon another cause supervening, the disease follows.

3.] These are the causes which supervening, together with the predisponent, constitute the immediate cause of the disease, and therefore necessarily produce the disease. Thus, for example, a plethora is a predisponent cause of the apoplexy: yet nevertheless plethoric persons frequently continue long thus exposed, without being seized with the disease. But if I know that a plethoric person will undergo violent exercise in very hot weather, drink too plentifully of rich wines, or be put into a violent and sudden fit of anger, I can foresee a future apoplexy in such a case.

4.] These signs are of the greatest use. For an apoplexy seldom comes on without any of the signs here enumerated, unless it is occasioned by a sudden bursting of the vessels: otherwise almost always some signs precede, which evidently demonstrate, that the functions of the brain begin to be disturbed, or at least not to be so readily performed. But frequently these appear so gentle both to the patients, and less skilful or heedless physicians, that they are neglected; and then the remedy, which, if it had been timely applied, might have prevented the apoplexy, is often used too late after the disease is begun.

A trembling.] This supposes an instability of that cause, which produces muscular motions; as was said before in the comment to §. 627: whence it is justly reckoned a sign of a future apoplexy in those, whose constitution and manner of living predispose them to this disease. But trembling alone is not an absolute sign of the disease being at hand: For in the febrile coldness there is almost always a trembling; as likewise in persons that are weakened by a late disease, too great evacuations, &c.; nay, in some persons, otherwise healthy, a trembling has been observed for several years, as was likewise remarked in the comment to §. 627. But when, together with this, other signs concur, which denote that the brain is loaded, then a trembling may very justly be suspected as well in acute

as in chronical diseases. Wherefore Hippocrates (see §. 629.) has pronounced tremblings in highly phrenitic patients to be fatal; and he has said, that tremblings are bad in those who are disturbed in their mind from an atrabiliary humour: and elsewhere, conjoining other signs with trembling, he says, *Valde surdi, dum aliquid prehendunt tremuli, linguam resoluti, torpidi, malum*; “Great deafness, a trembling upon laying hold of any thing, a stammering of the tongue, and torpor or numbness, form a bad sign^a.”

Sudden weakness, vertigo, scotomia.] The first symptom of a vertigo, as was said before, is an apparent rotation of neighbouring objects which are at rest; then the colours of the rainbow seem to glisten before the eyes, immediately all the muscles become weak, the person begins to be afraid lest he should fall, the strength is quite enervated so that he cannot support himself, and a disagreeable hissing noise is heard in the ears; and then, the complaint increasing, the eyes become dim, and this is called a *scotomia*, or a gloomy vertigo; soon after this, he falls down apoplectic. It appears plain enough from the above, that in the vertigo the whole common sensory is affected: but then especially a vertigo threatens an apoplexy, when the cause of the former is lodged within the cranium; and then the vertigo is called *idiopathic*. This is known from the constitution of the patient, and other concomitant signs. There is likewise a sympathetic vertigo, in which the common sensory is indeed affected, but the cause of the vertigo remains without the cranium; as for example, bile corrupted in the stomach, poisons swallowed down, &c.: but this species of vertigo rarely ends in an apoplexy. Wherefore Hippocrates together with a vertigo makes mention of other signs, which shew the cause of the vertigo to be placed within the cranium; he expresses himself thus, “Such persons as are subject to pains of the head, a noise of the ears without a fever, a very gloomy vertigo, a slowness of speech, and a numbness of the hand, you may expect will become either apoplectic, or epileptic.”

^a Coac. Prænot. n^o 198. Charter. Tom. VIII. p. 863.

“pileptic, or lose their memory^b.”

A numbness.] This denotes the sense of feeling either diminished or quite abolished in some certain part of the body: and is a sign which frequently uses to precede the apoplexy; especially if that kind of feeling attends it, as if the size of the numbed member was magnified. In plethoric persons it is frequently observed, that they feel their fingers as if they were increased in bulk, and the sense of touch is rendered more obtuse; nay, it is not without difficulty that they are able to clinch their fists. In this case we know, that, the blood vessels being too full, the common sensory begins to be oppressed within the cranium; and unless this plethora is suddenly removed, from a slight supervening cause an apoplexy will follow. In the mean time it is to be observed, that it is common enough for some persons to have frequent numbness in certain parts of the body without any great mischief. I know some, who for several years have had a numbness of this kind, if they sleep long lying upon either side; nay, it frequently happens to them even when they are awake. At first this symptom made them afraid; but as they found no harm ensue upon it, they began to be secure. Hence Hippocrates has said, *Unusual heaviness and numbness are a sign of a future apoplexy*^c.

Sleepiness.] An apoplexy has a great resemblance to a profound sleep, as was said before in the comment to §. 1008. hence there is no wonder that persons who have a tendency to this disease should be sleepy, seeing the brain begins to be compressed by humours gradually collected within the cranium, or by the smaller vessels being obstructed (see §. 106. d.) from the larger ones being too much distended with blood. I have seen several plethoric persons, or such as were very corpulent, who could hardly keep from sleeping the whole day; but it appears from what was before said, that such persons are most frequently seized

^b Ibid. n^o 162. Ibid. p. 861.

^c Torpores et stupores (*αραισθησιαι*) præter consuetudinem contingentes, apoplexiæ futuræ signum. Ibid. n^o 476. p. 879.

seized with the apoplexy.

A failing of the memory.] For this symptom denotes, that the common sensory is already disturbed; hence it is, in acute diseases, that sudden forgetfulness prognosticates a frenzy, (see §. 772.) We likewise frequently see in men of learning, when they begin to grow old, these eclipses, as we may call them, of the memory, almost always certainly prognosticate an apoplexy to follow. A remarkable case of this kind we read in Wepfer^d, of a prime minister, whose memory frequently failed him, and afterwards recovered; but, after this had happened a great many times, he died at last in a profound sleep of thirty hours. The cranium being opened, there flowed out a great quantity of water; and to the exterior surface of the brain there adhered small bladders, full of limpid water. But, which is remarkable in this case, he never complained of the head-ach, vertigo, or ringing of his ears; whence it appears, that this sign is of great moment in prognosticating the apoplexy, and especially that kind of which we treated at §. 1010. N° II. 3.

A ringing of the ears.] This likewise happens to healthy persons, who are in no danger of the apoplexy; seeing it may be produced from very slight causes, seated in the organs of hearing. But when a ringing of the ears is owing to the brain's being affected, then it is usually of longer continuance, and more frequently returns: and it is justly reckoned a sign of a compression of the brain, whether it arises from the blood-vessels being too much distended, as was said in the comment to §. 665, where we treated of Weakness in Fevers produced from this cause; or from liquids, extravasated in the cavity of the cranium, being sensibly increased: whence Hippocrates^e has likewise mentioned a ringing of the ears, amongst the signs which discover a collection of water in the brain.

An inflation of the face and neck, &c.] In the comment to §. 773. where we treated of the symptoms ac-

^d Observat. Med. Pract. de Affect. Capit. p. 359.
lib. ii. cap. 6. Charter. Tom. VII. p. 556.

^e De Morb.

accompanying the frenzy, we mentioned that florid and fierce countenance, which shewed the free passage of the blood through the branches of the internal carotids to be hindered, and therefore the external branches to be more filled. When an apoplexy is threatened from too great a plethora, then this redness or inflation as it were of the face is observed. But when there is a phlegmatic, slow cacochymia, in that case the body grows turgid, but with a cold swelling; and almost the first signs appear in the face, while that flaccid part of it under the eyes begins to swell. But the more that the inside of the cranium is filled with such phlegmatic humours, the more likewise does the face appear inflated; whence pale, turgid, and moist eyes were reckoned amongst the signs of the apoplexy arising from this cause, in the comment to §. 1010, N^o II. 3.

The respiration stronger than usual, &c.] In the time of sleep especially the respiration is increased: and being stronger than usual in the apoplexy (see §. 1008.) such respiration denotes the sleep to be sounder than natural, and to incline towards apoplectic. But the alæ of the nostrils being compressed shew a beginning palsy of the muscles of the face, by which these alæ are kept open. For frequently the first signs of a threatening apoplexy are conspicuous in the face, while the muscles being weakened on one side of it, those situated on the opposite side prevail, and being more contracted change the countenance surprisingly. At this very time, whilst I am writing these comments, I have an opportunity of seeing, in a noble patient, one side of the face only paralytic, and the alæ of the nostril on the same side collapsed.

Incubus.] This is said to be present, when in the time of sleep there is felt a great anxiety, with a sense of incumbent weight, together with an inability to move or speak. All who have suffered this complaint agree, that this was their situation, and that they found themselves relieved as soon as they were able to move or speak. But even when the common sensory is so changed from any internal cause, as it is by external causes

causes acting upon the body, then the person persuades himself that those external causes really exist and act, as was explained before at large in the comment to §. 700, where we treated of Delirium in fevers; so the reason appears, why they imagine that a spectre is lying upon them, and threatening to suffocate them. For as the origin of ideas does not answer to external causes, but to the internal disposition of the brain, hence very strange fancies are produced, as was then explained. Wherefore it is called *Incubus*, or likewise *Incubo*; *siquidem veluti adscendere atque insidere suo pectori sentiunt quidquam*, “because they
 “feel something as it were climbing up or sitting
 “upon their breasts f.” From the sense of a threatening suffocation it was called by Themison *Πνιγαλεων*. But as by the Latins it is named *Incubus* from *Incubare* (to hatch); so by the Greeks it is called *εφαλληπτης*, from *εφαλλεσθαι* (to leap upon), because those who are seized with this complaint imagine themselves to be kept down by something leaping upon them. I have known this happen to some persons, while, sleeping upon their back, and the pillow having slipped from under their head, they lay with their neck bent backwards: the same thing likewise happens to persons sleeping upon their sides with their head bent much forwards, whereby their neck is bent the same way. Perhaps when the head is reclined so much backwards, the whole bulk of the brain presses upon the lateral sinuses and the torcular of Herophilus; and when the head is inclined forwards, in the manner above-mentioned, the free return of the blood by the jugular veins is hindered, and thence the action of the brain is disturbed. But it easily appears, that the incubus, proceeding only from a wrong posture of the head in sleep, is not so bad an omen: for several persons have suffered that complaint from this cause without any bad consequence: But when it arises from a morbid cause; for example, from lymph collected gradually in the head; then it frequently uses to recur, and threatens an apoplexy, or other obstinate complaints depending
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f Cælius Aurelian. Morbor. Chronic. lib. i. cap. iii. p. 233. & Ibid.

upon the common sensory being disturbed. Whence Aëtius has said, “ That which is called incubus, is
 “ not a dæmon ; but rather a fore-runner of the epi-
 “ lepsy, madness, or apoplexy ^h.” And a little after
 he adds, “ Wherefore we ought to check this com-
 “ plaint at first ; for if it is suffered to go on, and to
 “ gather strength, it will occasion some of the above
 “ diseases, by a thick humour being collected by de-
 “ grees in the ventricles of the brain.”

§. 1021. **A**N apoplexy is easily known to be present, provided the different degrees of that disease are distinguished.

For a perfect apoplexy is known by those signs which are enumerated §. 1008. And how the different degrees of this disease may be distinguished, was explained in the comments to §. 1013, 1015, 1016.

§. 1022. **T**HERE can be no general cure prescribed for this disease: for it ought to be varied according to the variety of the cause (1010.), the manner of its being applied, and of the part affected ; and it should likewise be applied before the disease is got to a head.

This appears at first sight from the bare reciting of the causes §. 1010. ; for these are so different, that frequently they require quite opposite remedies. This is the more necessary to be observed ; because such medicines are boasted off, as are frequently sold to great persons, who are most subject to this disease on account of their high living, at a very exorbitant price ; and almost all consist of very hot aromatics, volatiles, alkaline salts, and the like, which in an apoplexy arising from a plethora or an inflammation are extremely hurtful. Besides, if a tumour should compress the jugular veins, it would be in vain to apply any remedy.

dy to the head, seeing the whole cure would depend upon removing that tumour. But as this disease, even when it is only gentle, is so difficult to cure, as was said before; in order to succeed, it is adviseable rather to prevent it if possible, by proper means timely applied before it comes on, or at least to use every thing that can be of service in the very beginning of the disease: for after it has gathered strength, it will soon become mortal; or if the patient escapes with his life, the functions of the common sensory will hardly ever be entirely restored, but he will live miserably ever after; as was said in the comment to §. 1018. It is therefore proper to describe the cure in order, according to the different classes of the causes.

§. 1023. **I**F therefore we see by the symptoms there mentioned, that an apoplexy is threatened from a viscid, inert, and cold cause (§. 1010. N^o II. 3.) we must immediately endeavour, 1. To divert the pressure of the glutinous matter from the head; 2. To attenuate the lentor in the brain, and in the whole body.

When the vessels of the brain are already obstructed with such a viscid humour, there remain but small hopes of a cure: hence again it appears so adviseable that the cure should be set about, while, by the sign above described, the apoplexy is observed to be coming on. There are therefore two heads of this cure to be considered. For if that pituitous cacochym could be immediately removed, the cure would be most complete: but it requires some time to attenuate the viscid humours; and therefore it would be necessary by all means to divert them from flowing to the head. For although they should occupy other part of the body, and hinder their functions, there will thereby be less danger, and hopes of an easier cure while leucophlegmatic persons, or young girls labouring under a chlorosis, have the whole body turgid with such a viscid and pituitous humour, they are lar

guid indeed; but nevertheless may be cured, as long as this phlegm is not collected in the brain. It follows next to be considered, by what means these two conditions may be obtained, to prevent an apoplexy from a viscid and glutinous indisposition of the blood.

§. 1024. **T**HE pressure upon the vessels of the brain is diminished, 1. By diverting it to other, and opposite, parts of the body; 2. By universal evacuations.

1. While the heart drives the blood into the aorta, it is propelled through all its branches proportionally to the magnitude of their diameters; provided that the resistances are every where equal: Therefore, that the force and quantity of humours may be derived from the vessels of the brain, the resistance of the vessels in other parts ought to be lessened, that they may be rendered more capacious; and then this derivation will be obtained, especially if the vessels in the lower part of the body are so disposed as that they can receive a greater quantity of humours. Hence the hæmorrhoids, menstrua, and looseness, are of such service in this disease, as was observed in the comment to §. 1017.

2. Because by these the quantity of humours to be moved through the vessels is diminished. Each of these shall be considered separately in the two following aphorisms.

§. 1025. **V**APOUR-BATHS, fomentations, hot baths, dry-cupping, epispastics, sinapisms, blisters, caustics, issues, setons, frictions, and ligatures on particular parts, applied to the larger veins, feet, legs, and thighs, are of service for the first intention, (§. 1024, n^o 1.). Mouth-washes, gargles, masticatories, sialagogues, and errhines, applied to the mouth, fauces, and nostrils, are of use for the same.

All the former are applied to the lower parts of the body: Some of them with this intention, that, the resistance of the sides of the vessels being diminished, these parts may be rendered more turgid with humours, and thereby a smaller quantity of the fluids be sent upwards. For vapour-baths, fomentations, and hot baths, have this effect, by relaxing the solids: Suctions, especially by means of cupping-glasses, by taking off, or very much lessening, the pressure of the atmosphere, immediately produce a considerable swelling of the parts to which they are applied: Other applications, by irritating these parts, increase the motion of the humours through them; of which kind are epispastics, sinapisms, &c. But of all these, which can be of service in deriving the force of the humours to other parts, we treated before in the comment to §. 396, n^o 4. treating of the Cure of an Inflammation; and in the same place each of these was explained, as likewise in the comment to §. 134, where we treated of derivative, attractive, and propelling remedies in the cure of an Obstruction.

But as in the cure of an inflammation we ought always to take care, lest by too acrid irritating remedies the motion of the blood should be increased all over the body; therefore vesicatories, especially prepared of cantharides, were commended with more caution. But in this species of apoplexy, which is most common to persons of a cold constitution, and in which there is an inert phlegmatic indisposition of the blood, the use of cantharides is more safe, because at the same time they are useful in attenuating that phlegm, as will be said afterwards at §. 1027. What a surprising good effect setons have in curing diseases of the head, was said before in the comment to §. 396, and is likewise confirmed by several observations in this very disease. For thus a numbness, remaining after an apoplexy, which had been in vain attempted to be removed by blisters and an issue, was entirely cured by a seton^a. So likewise, in a boy, who by a fall from a horse had been rendered apoplectic, the memory remained hurt
for

^a La Motte Traite Complet de Chirurgie, Tom. I. p. 122.

for several weeks: but by means of a seton he was perfectly recovered in eight days ^b.

But such ligatures of the joints, as they must compress the veins, more than the arteries, which for the most part are deeper situated, and therefore not so easily compressed, occasion a great quantity of humours to be gathered in the extremities, seeing the arteries admit the blood, while the veins being compressed hinder its return to the heart; hence it will be sent in much smaller quantity to the head. Wherefore ligatures of the joints were commended upon another occasion for stopping a bleeding at the nose (see §. 743). Besides, we read of apoplectic persons having been rouzed by tight ligatures applied to the legs ^c. But then they seem rather to have been of service by occasioning pain, than by compressing the vessels; because such a tight ligature must likewise compress the arteries, and therefore lessen the number of the vessels which transmit the blood to the lower extremities; whereas a more gentle one straitens the veins only, not the arteries, and therefore is of more service in diminishing the impulse of the blood towards the head.

But a derivation of inert and cold phlegm from the brain may likewise be made another way. It appears from physiology, that the whole internal side of the mouth and fauces is always naturally moistened with mucus; that the sound saliva itself has something of lentor; and that the internal surface of the nostrils is lined with a mucous humour, which hardens into thick snout, that however may be dissolved in water. But all the vessels secreting mucus in these parts, receive the arterial blood, from which that secretion is made, from branches of the external carotid arteries; whence it appears, that the blood going to the brain, and destined for the secretion of the nervous fluid, is freed from saliva and mucous matter ^d, before it flows through the vessels of the brain. If therefore an apoplexy is feared from such a mucous lentor, physicians very ju-

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dici-

^b Medical Essays, Vol. V. part ii. Obs. 52. p. 598. ^c La Motte loco modo citato. ^d H. Boerhaave Instit. Medic. sect. 235.

diciously try to increase the secretion of mucus in all these parts, that thereby the blood may be sent more pure to the brain. But the secretion of that mucus may be increased in those parts, by relaxing the excretory vessels by means of emollient gargles, that they may the more easily spue out the secreted liquids; and especially if these parts are irritated by stimulating medicines, for then they discharge a greater quantity of liquid, as is constantly observed. In the *Materia Medica* for this number there is a stimulating decoction of this kind, composed of the more acrid aromatics, which may be used by way of gargle to great advantage in this case. It appears further from physiology^e, that the sources and excretory vessels of the saliva are so situated, as by the motion of manducation they especially pour out their humours: Hence likewise masticatories are commended, which usually have such things for their basis as may be chewed a long while and do not easily melt in the saliva; such as wax, for example, especially mastich, which may be chewed a whole day without any considerable diminution of its substance: to these are added acrid aromatics, which, by stimulating and irritating, produce a greater discharge of saliva and mucus; such are the root of pelitory, ginger, pepper, &c. There is also a prescription for a masticatory of this kind in the *Materia Medica* of this number. Applications of the same kind may be made use of to the nostrils; but with this caution, that you must refrain from the more acrid ones, because the internal surface of the nose is much easier irritated than the inside of the mouth and fauces, and therefore too violent a sneezing may be thereby occasioned. Remedies very proper for this use, are mentioned in the *Institutions*^f: but those contained in the last number there, are of the more acrid kind; for which reason they ought to be used with great caution, and almost only in those persons whose nostrils are in a manner rendered callous by the long use of tobacco. These medicines draw such a quantity of mucus from the nose, that they are called *apophlegmatismi*

^e *Ibid.* sect. 63.^f *Ibid.* sect. 1195. 1, 2, 3, 4.

mi (*i. e.* medicines to draw off phlegm), which are commended by Aretæus⁸ against all complaints of the head. But it appears from what has been said, that all these are of service in a double capacity, *viz.* By evacuating part of the morbid matter; and, By increasing the quantity and motion of the humours thro' the branches of the external carotid, whereby they avert the pressure from the brain, to which the internal carotids are sent. On account of this last effect, mouth-washes and gargles were commended in the cure of the Frenzy (see §. 781); but gentle ones, because in an acute and inflammatory disease stimulating medicines are not void of danger.

§. 1026. **V**OMITS and strong purges given so as to produce a certain effect, scarifications, and bleeding, answer the second intention (§. 1024, n^o 2.); although they are always attended with some uncertainty.

Evacuations of all kinds, by carrying off a quantity of liquids, lessen the pressure of the fluids upon the vessels; but it ought to be considered, whether evacuations are always proper, and what kind. In this species of the disease, the body is always turgid with viscid pituitous humours; and it is often attended with a frequent vomiting of phlegm, (see §. 1010, N^o II. 3.): therefore it appears proper enough to carry off part of that pituitous matter, which loads the *primæ viæ*, by means of a vomit, and so prevent its being further mixed with the blood. Celsus has observed, that a vomit is of service to those, *quibus frequens saliva, vel nausea est; aut sonant aures, aut madent oculi*; “who spit a great deal, or are subject to a nausea; or who have a noise in the ears, or moist eyes^a.” All which symptoms are present in this disease, (see §. 1010, N^o II. 3. and §. 1020, n^o 4.). Wherefore the use of a vomit in this case does not appear to be altogether improper; and in the *Materia Medica* for this number there

⁸ De Curat. Morbor. Diuturnor. lib. i. cap. 11. p. 115.

^a Lib. i.

cap. 3. p. 30.

there are several formulæ, which are adapted to this purpose. But in the mean time, in the very act of vomiting, as has been already frequently observed, the humours are driven in greater quantity and with greater force towards the head; and therefore this effect is repugnant to the first indication (§. 1023.) which orders the pressure of the glutinous matter to be diverted from the head. It is therefore very justly observed in the text, that these are always attended with some uncertainty, viz. as far as in vomiting the vessels of the brain are too much distended: whence Hippocrates has observed, *A hickup and redness of the eyes from vomiting, are a bad omen*^b. But it was demonstrated upon another occasion (see §. 772,) that a redness of the eyes denotes the vessels of the brain to be too turgid with blood. Whence Aretæus does not commend vomits in this disease, but he speaks in praise of purges: Only a spontaneous vomiting he does not disapprove of, saying, “ But during the operation of a purge, if the patient is seized with a reaching, do not check it; for it likewise has some effect of rousing him, and the vomiting of phlegm removes the cause of the disease^c.”

Purgatives therefore seem to be more safe, seeing by evacuating they determine both the force and quantity of the humours downwards; and a gentle apoplexy is sometimes spontaneously cured by a looseness, as was said §. 1017. But strong purges are recommended, that they may produce a certain effect, and evacuate plentifully. Whence Aretæus^d recommends a whole potion, or a dose, of hiera; which seems to be four or five drachms, as appears from another passage^e. But that the above purge was sufficiently strong, is plain from what the same author says elsewhere^f. For in the cure of a lethargy, when he wanted to give a strong purge, he exhibited only two drachms of hiera, with three spoonfuls of honey and water; which seems to be

^b A vomitu singultus et oculorum rubor, malum. *Aphor. 2. sect. vi. Charter. Tom. IX. p. 293.*

^c De Curat. Morbor. Acutor. lib. i. cap. 4. p. 82.

^d Ibid.

^e De Curat. Morbor. Diuturnor. lib. i. cap. 2. p. 115. ^f De Curat. Morbor. Acutor. ibid. p. 78.

be the half potion, which he recommends in curing the apoplexy^g, if the weakness of the patient hinders his giving a full dose. In the *Materia Medica* for this number, there is prescribed an efficacious enough purging potion of scammony, and resin of jalap, which may be of great service, both in resolving and evacuating the morbid matter. But two hours after taking of that purge, an acrid glister is to be injected, that the force of the purgative may be the sooner determined downwards.

But bleeding in this case seems to be more uncertain as to its effect, than the other evacuations. Nay, it hardly appears to be of any use at all: For if we compare what was said in §. 1010. No II. 3. it will appear, that the red part of the blood is deficient in these patients; and from this cause arise that languor, and numbness, and the accumulation of lymph in the cavities of the body, whence the whole train of symptoms, there recited, was deducted. When therefore the quantity of the blood is diminished by bleeding or scarifications, the cause of the disease will thereby be increased. In the mean time there is nothing more common in practice, than for physicians to have immediate recourse to bleeding, whenever an apoplexy is threatened: nay, they suffer in their characters, among the ignorant vulgar, if they neglect this remedy. Celsus too seems always to advise bleeding; when he says, that *maxime fieri debet, ubi nervi resoluti sunt, ubi subito aliquis obmutuit*; “ it ought chiefly to be done, “ when the nerves are rendered paralytic, or when a “ person suddenly loses his speech^h.” But if it is considered, that evacuations are then only useful in diseases, when they either remove the morbid matter, diminish the too great quantity of good blood in plethoric persons, check the too great rapidity of the circulation, or divert the force of the circulating humours from the parts affected to other parts of the body; it easily appears, that there cannot be expected much good from bleeding in this case. For the motion of the blood through the vessels is languid; its quan-

^g Ibid. cap. 4. p. 82.

^h Lib. ii. cap. 10. p. 79.

quantity is deficient; the extravasated morbid matter is accumulated in the cavities of the body; or a viscid glutinous phlegm begins to stick in the extremities of the arteries; and therefore can by no means be evacuated by bleeding, because only that can pass by the veins which is able to get through the extremities of the arteries. And as to revulsion from the head, that may be better affected, and with more safety, by those remedies which were recommended in the preceding paragraph. Nay, Celsus himself very prudently observes concerning bleeding, that we ought to consider *etiam morbi genus quod sit, utrum superans an deficiens materia læserit*; “ what the nature of the disease is, whether the matter hurts by excess or deficiency ¹.” Certainly in this case the blood is deficient, and not exuberant in quantity; and therefore ought not to be evacuated. Aretæus judiciously advises, “ that when
 “ a person is seized with great coldness, numbness,
 “ and a privation of the senses ^k,” bleeding ought by no means to be ordered: but then he had recourse to acrid glisters, and purgatives, that he might both free the intestines of their load, and make a revulsion of the humours from the head. Hippocrates likewise says, “ That letting of blood in a cold numbness, is
 “ bad ^l.” The same is true of scarifying, and cupping; which may be of very great service by making a revulsion, as was said in the preceding paragraph; but by evacuating the blood in this case, they likewise must be hurtful, for the reasons just now given.

§. 1027. **B**UT the lentor, after using those methods (1024, 1025, 1026.) which determine the humours to particular parts, is dissolved by general remedies prescribed against phlegm (75), prudently administered, and applied to the head in every shape: blisters by cantharides are the most useful of the whole, and likewise insects of the same kind taken inwardly.

Now

¹ Ibid. p. 78.

^k De Curat. Morb. Acutor. lib. i. cap. 4. p. 81.

^l Coac. Prænot. 343, 421. Charter. Tom. VIII. p. 871, 880.

Now follows the other part of the indication of cure, viz. "To attenuate the lentor in the brain, and in the whole body." We treated formerly, in a particular chapter, of a Spontaneous Gluten, and its causes were there recited, (see §. 69, to §. 76.): at the same time those complaints were enumerated, which may arise from such an indisposition of the blood; and amongst these it was remarked, that the animal functions were thereby likewise disturbed. In the same place also every thing is mentioned that tends to the cure of a spontaneous gluten, both with regard to diet, medicines, and exercise of the body. But as exercise and stimulating remedies are there recommended, it evidently appears, that there is need of great judgment in the cure of this cacochymia, when the symptoms shew the functions of the brain to be disturbed: For if you suddenly disturb the humours before they are sufficiently attenuated, they will stick so much the more obstinately in the extremities of the vessels, and all the complaints will be increased. This is the reason why determining remedies ought first to be applied, that the pressure may be diverted from the head as much as possible, and at the same time a part of the viscid phlegm may be removed by evacuants. Then we must begin with gentle dissolvents; and especially with those which resolve powerfully, and at the same time do not increase the force of the circulation suddenly and violently, such as Venice soap, tartarized tartar, regenerated tartar, fixed alkaline salts of the ashes of plants, &c. After these have been some time used, if the symptoms, becoming easier, teach us that the lentor is attenuated; then more acrid dissolvents, and such as more increase the motion of the humours, may safely be used; together with corroborants, which correct the too great laxity of the solids, a constant attendant on this kind of cacochymia. In the *Materia Medica* to §. 75. you have all these remedies, ranged in their proper classes. Likewise, the head being shaved, fomentations and epithems of the same kind of medicines may be applied to it with success, that by all these helps joined together the lentor may be attenuated

both

both in the whole body and in the brain.

But blisters are here of the greatest service; not only as, by stimulating and irritating the part to which they are applied, they make a revulsion towards other parts of the body, as was said in the comment to §. 1025; but likewise, as, by separating the cuticle from the skin, they occasion a great collection of lymph under the epidermis, which, upon the blister's being cut, frequently continues to be discharged several days; at the same time they increase the motion of the blood through the whole body, and dissolve and attenuate the lentor of the fluids. In some places, physicians apply a kind of cap spread over with blistering plaster to the head, immediately after it has been shaved; which indeed occasions a good deal of uneasiness, but at the same time is of great service in diseases of this kind. The celebrated Wepfer^a, when the symptoms of an apoplexy from a serous viscosity threatened, recommends this remedy as the most effectual of any: nay, he orders it to be repeated two or three times; especially with this caution, that it be only applied to the hairy scalp, and fastened in such a manner with a fillet, as by changing its situation it may not touch the ears or the skin bordering upon the scalp. He affirms, that by this means, without pain, or raising a blister (unless where there happens to be a cicatrix), a great quantity of water may be discharged from the skin, with a sensible good effect. In another place he advises^b, not to shave the head, but only to clip off the hair with a pair of scissors: and at the same time he adds this caution, that the plaster ought not to be left on above eight days; because, if it is allowed to stick longer, it usually occasions a troublesome strangury. Insects endued with a like quality, but more gentle, may serve the same intention, given internally; such as millepedes, cochineal, &c. But the internal use of cantharides is justly suspected; and therefore prudent physicians very seldom prescribe them.

§. 1028.

^a Observat. Medic. Practic. de Affect. Capit. p. 71, 229, 255.

^b Ibid. 231, 250.

§. 1028. **I**F an apoplexy is already produced by the same causes! (1023), it is seldom cured: but, if the patient's strength will bear it, the same remedies ought to be tried (1023, to 1028); every thing that can rouse the senses ought to be applied to the nose, mouth, and head; the most acrid stimulating medicines are to be used, and the bowels to be emptied with a sharp glister.

Seeing it is so difficult to hinder an apoplexy from following when the whole body labours under such a viscid and glutinous cacochymy, it easily appears that there must be still less hopes of curing an apoplexy already produced; and therefore it is not without reason here remarked, that "it is seldom cured." In the mean time it seems hard, after pronouncing this fatal prognostic, to leave the patient to his fate; and the physician might be blamed, as if he neglected those remedies from which there is something still to be hoped. Wherefore every thing that may be of service ought immediately to be tried, after having first acquainted the patient's friends with the great and almost inevitable danger of his dying. But as the same cause obtains in this apoplexy after it is produced, which was formerly explained as giving occasion for dreading a future apoplexy; it is sufficiently evident, that it must require the same method of cure which is described in the preceding aphorisms. Wherefore we must attempt a sudden revulsion from the head, by those remedies mentioned §. 1025, and especially by blisters; and at the same time an evacuation ought to be made, provided the patient has strength enough to bear it. But as such apoplectic patients can hardly swallow any thing, the chief hope remains in administering a glister of the acrid kind, that the bowels may be emptied quickly and effectually. For this remedy Aretæus justly expected both a diminution of the quantity of humours, and a revulsion from the head: but he orders that the glister be made very acrid, by adding euphorbium and colloquintida

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tidato it. Neither does he seem to have tried any thing else in this case; unless, after the glister was administered, (*paulum excitatus homo fuerit, aut febre correptus, aut sensum ab illo stupore recipiens, aut arteriæ bono pulsu restituto, aut facie utcumque meliora significante; tunc enim spes salutis concipienda est, audaciusque subveniendum*), “ the patient was a little rouzed, or
 “ seized with a fever, or shewed some signs of his
 “ senses returning, or a good pulse was restored, or
 “ his face put on a better appearance; for then there
 “ was some hope of his recovery, and the physician
 “ might proceed more boldly to assist him ^c.” There is a prescription of such an acrid glister in the *Materia Medica* at this number; and others of the same kind may be prepared, from the roots of black hellebore, (for example), of which an ounce boiled in water affords a potent remedy: but as in this case there is danger in delaying, it is proper to be as quick as possible in giving the remedy. There is a medicine in the shops called *Confectio Hamech*, which contains a good quantity of colloquintida: of this an ounce, or an ounce and a half, diluted in ten ounces of water, with the addition of two drachms of sal gemmæ, makes a glister of this kind; which should likewise be repeated, if it happens to be voided soon after it has been injected.

Besides, it is usual to apply the most acrid stimulating medicines to various parts of the body, in order to rouze the stupefied senses. For this purpose they use the volatile spirit of sal armoniac; some recommend the strongest vinegar mixed with tincture of castor; some apply to the temples, or rub the nose with, those balsams which are called apoplectic, prepared of the most acrid distilled oils; besides blisters, hot epispastics of bruised mustard-seed or horse-radish are applied to the feet. Nay, perhaps there is no disease in which the patients are so roughly handled, and indeed with so much reason: for either by all these being tried at once they are rescued from imminent danger; or if they fail of success, still the patient suffers

no

no manner of pain from them, being entirely destitute of the sense of feeling.

§. 1029. **H**OWEVER, by the use of all these (1028) the disease is frequently increased, the morbid matter being more moved, and pushed farther into the vessels, by all stimulating medicines: and by means of evacuants the strength is soon impaired. Hence, in dissolving the fluids, we should always have our eye as much as possible upon evacuation and revulsion: hence the rule, “Venesection, if it is not of service, kills.”

It was said before in the comment to §. 75, where we treated of the cure of diseases arising from a Spontaneous Gluten, that increased motion was of service; but at the same time we ought to take care, lest, by raising a sudden motion, that mucous matter should be propelled into the narrow branches of the vessels, and, there remaining fixed, produce dangerous diseases. While therefore such matter, occupying the brain, produces an apoplexy, it is very plain, that there must always be danger, lest by powerful stimulants, applied all at once, and in every shape, the disease should be increased, while by these the morbid matter, not yet sufficiently resolved to be able to pass thro’ the vessels, is propelled with greater violence. Evacuants indeed seem safer; but sometimes, in those patients who are weak and languid before the disease comes on, the strength is immediately crushed by plentiful evacuations. Whence it appears, that there is great need of judgment in this case, that the physician may both consult the good of his patient, and at the same time his own reputation, in this doubtful disease. For if these acrid exciting remedies should not be used, or only sparingly, with a prudent intention, the ignorant or spiteful may ascribe the death of the patient to the neglect of them. And, in like manner, if after sudden evacuations, the strength immediately failing,

the patient should die, the physician would be blamed, especially amongst people of quality, who are never thought to die of diseases, but by the errors of the physicians. In the mean time all judicious physicians confess, that nothing else remains towards curing this disease, but either by evacuating to carry off the morbid matter, or by attenuating to render it capable of passing through the vessels. It would be best of all, if these two could be brought about at the same time, seeing the present danger can admit of no delay; and while these are a doing, the pressure of the glutinous matter should by all possible means be diverted from the head.

Celsus has laid down the following general practical axiom: *If all the limbs are rendered quite paralytic, bleeding either kills, or gives relief*^a. But that axiom, being wrong understood, has frequently given a handle for blaming physicians: for if the patient should die after the venesection, it would be pronounced, from the authority of Celsus, that the physician had killed him; and if he should die without being blooded, the physician will again be blamed, because he did not give him the chance of being relieved by bleeding. Hence, either way, there is a trap laid for the physician's reputation by this assertion of Celsus. But it appears, that the death of the patient must be very wrongfully ascribed to bleeding, when the disease of itself is so frequently incurable: For then indeed he dies *after* being blooded, but not *because* he was blooded; which two circumstances ought to be very well distinguished. In weakly persons, bleeding indeed lessens the vis vitæ, but it does not occasion certain death. Whence Celsus seems only to have meant, that if the disease was not relieved by bleeding, then no hope remained; which appears from what immediately follows the passage above quoted. For it runs thus: *Another method of cure hardly ever recovers the patient; it frequently only delays death for a while, and in the mean time torments him while alive. After bleeding, if sense and motion do*
not

^a Si omnia membra vehementer resoluta sunt, sanguinis detractio vel occidit vel liberat. Lib. iii. cap. 27. p. 178.

not return, there remains no hope; but if they do return, a cure may likewise be expected^b. Thus Celsus acknowledges, that there is no remedy more effectual; and therefore he does not condemn bleeding: and, in an incurable disease, to be able to delay death, is to be sure no small affair. Moreover Celsus, in a particular chapter on venesection, urges, that this ought chiefly to be done in the apoplexy. The passage was mentioned before upon another occasion, treating of the cure of an Ardent Fever, in the comment to §. 743; but as it serves very well for explaining and understanding the practical rule abovementioned, it will not be amiss to repeat it here: “ But it may so happen, that the
 “ disease may require, what the body seems but very
 “ ill capable of supporting. But if there appears no
 “ other relief, and the patient must perish unless assisted even by a rash method; in this case it is the
 “ part of a good physician to declare, that there are no
 “ hopes without bleeding; and at the same time to
 “ confess, how much danger there is in that remedy
 “ itself: and then at length, if it is necessary, he may
 “ proceed to use the lancet. But in an affair of this
 “ nature, a physician ought not in the least to doubt
 “ or hesitate; for it is better to try a doubtful remedy,
 “ than none at all. And this ought chiefly to be done,
 “ when the nerves are rendered paralytic, and when
 “ a person suddenly loses his speech, *&c.*”

No body at present doubts of the usefulness of bleeding in that species of apoplexy which arises from a plethora, an inflammation, or too great a velocity of the blood determined towards the head, (concerning which we shall speak in the following paragraph); but it has frequently been disputed, whether bleeding can be of service in that species of this disease which arises from a glutinous lentor of the blood. It was said before in the comment to §. 1026, that there was not much good to be hoped for from thence in correcting a pi-

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^b Aliud curationis generis vix unquam sanitatem restituit; saepe mortem tantum differt; vitam interim infestat. Post sanguinis missionem, si non redit motus et mens, nihil spei superest; si redit, sanitas quoque prospicitur. *Ibid.*

^c Lib. ii. cap. 10. p. 79.

tuitous indisposition of the blood from whence a future apoplexy is threatened. But after the apoplexy is once come on, several skilful and judicious physicians order it; but moderate, and with caution, as in this case the blood does not abound; chiefly with this intention, that acrid stimulating medicines may be more safely applied after, and with less fear of a sudden rarefaction of the humours, which might be hurtful in this case. Whence it seems not altogether improper even in this kind of apoplexy, if the patient has strength enough to bear it. There are some excellent advices of Archigenes, to be met with in Aëtius^d upon this subject. He orders the stomach to be gently emptied by tickling the fauces with a feather, and the intestines likewise to be cleansed by means of a smart clyster; which at the same time serves for a revulsion, as was observed before. These things being done, having first given proper warning of the danger, he orders the patient to be bled in the right arm; but “in small quantities; for it ought to rouse, not to diminish or extinguish the heat.” He very prudently advises to observe the pulse, the colour of the face, and the respiration, during the time that the blood flows; and if there is no change for the worse, more may be taken away. After bleeding, he proceeds to administer such things as are capable of rousing the stupefied senses; such as acrid perfumes, and loud bawlings, &c. But where he imagined bleeding not to be proper, then he applied large cupping-glasses to the loins and groins; and he affirms, that thereby the body was frequently opened, and at the same time the apoplectic patient recovered. With these cautions, therefore, bleeding may likewise be used in this case; but it ought to be moderate and in the presence of the physician, that the vein may be immediately stopt in case the vis vitæ should be observed to be weakened by it.

§. 1030. **B**UT if by the signs above-mentioned (1010. N^o II. 2. N^o III. 1, 3.) we fore-

^d Lib. vi. cap. 27. p. 108.

foresee an apoplexy coming on, we ought immediately to have recourse to such remedies as most quickly empty the vessels, resolve the concremented fluids, and make a revulsion from the brain.

1. Therefore blood must be let as quick as possible, in large quantities, and from the jugular veins; and this must be repeated as often as occasion requires: for after it, in case the disease is curable, the patient commonly finds immediate relief. 2. Then a strong antiphlogistic purge must be given, and several times repeated, so as to produce an artificial diarrhoea; but if the purge does not operate soon enough, it ought to be quickened by an acrid clyster. 3. Afterwards, during the whole course of the disease, cooling, diluting, attenuating, and diuretic medicines, ought to be exhibited. 4. At the same time strong repellents ought carefully to be added, till the disease is quite overcome. 5. The patient's diet and drink ought to be very weak. 6. He must carefully guard against every stimulating, irritating, heating medicine; from external heat; and from lying in bed, especially flat upon his back.

When by the signs above enumerated it appears, that the blood-vessels in the brain are too much distended, either from a plethora, or an inflammatory thickness of the blood, or from its being determined with too great velocity to the head; in this case, a sudden depletion is necessary, as also a resolution of the concremented blood, and a revulsion from the head.

1.] As long as diseases can be cured by taking away what is superfluous, medicine usually affords certain and sudden relief. But the cure is much more difficult, when any defect in the body is to be supplied, or the concremented humours are to be dissolved. All physicians agree, that bleeding is useful in this case, and

to a considerable quantity, *ut magno effectui magnum remedium opponatur*, “ that a great remedy may be “ opposed to a great disease ^a.” For, as Aretæus very well remarks, *si minus detraxeris quam causa postulat, nihil magni per magnum auxilium conferes*; “ if you “ take away less than the case requires, you afford “ but little assistance by a powerful remedy ^b.” It is very true, he likewise observes, that it is difficult to determine the proper quantity, seeing too plentiful bleeding may be hurtful in this case. But it must be remarked, that he there speaks of an apoplexy in general; but not in particular of the *sanguine* apoplexy, as it is called by physicians, of which we are now treating; where the quantity of blood abounds in the whole body, or at least in the vessels of the brain, in which case even plentiful bleeding can hardly ever prove hurtful. For the most part a present ease of all the symptoms immediately follows upon this operation, if the vessels of the brain are not yet burst and have poured out the blood, or the tender nervous vessels are not too much compressed by the distended larger canals. Nay, in plethoric persons, sometimes bleeding ought to be frequently repeated; because, by that part of the blood which distends the vessels being taken away, the circulatory motion, before still and as it were suppressed, is suddenly excited, and so throws the patient into fresh danger. But the fulness, hardness, and celerity of the pulse, give certain enough signs to the skilful physician, whereby he can determine whether there is occasion for repeated bleeding or not. Physicians have especially recommended bleeding in the jugular veins, because thereby the vessels of the brain are immediately emptied: but in order to let blood there, surgeons usually tie a fillet about the neck, in order to make the veins swell, so that they may the more certainly prick them with the lancet. While this is done, if the vessels in the brain are very full, there is danger of their bursting; and therefore a compression of these veins was reckoned among the causes of the apoplexy §. 1010. No III. 4.: where-

^a Aret. de Curat. Morbor. Acut. lib. i. cap. 5. p. 81.

^b Ibid.

wherefore it seems safer, when there is a necessity for repeated bleeding, first to empty the vessels in some measure by bleeding in the arm or foot, and afterwards to open the jugulars.

2.] The great efficacy of purgatives in curing, and likewise in preventing this disease, was explained at §. 1017, 1026; for they are of service, both by evacuating, and by making a revulsion from the head. But in this species of apoplexy, *viz.* the sanguine and hot, such purgatives are requisite as scour the body briskly without increasing the motion of the humours, and at the same time are of use in dissolving the inflammatory thickness of the blood. These are called *antiphlogistic purges*. A decoction of the leaves of senna, with tamarinds, is usually given in such a case; and if it does not move the patient quickly enough, the larger intestines are stimulated by an acrid clyster of nitre, or sal gem, with simple oxymel, and the like, that the action of the purge before exhibited may be determined so much the sooner and more certainly towards the belly. But those clysters of colocintida, black hellebore, &c. recommended in the comment to §. 1028, would not be proper here, because they increase the motion of the humours too much. It is even better, for several days, by such purges as above given in a smaller dose, to promote an artificial looseness, till the heat of the body being diminished, the fulness of the vessels lessened, and the relief of the symptoms which usually precede the apoplexy, teach us that the curative indication is answered. See likewise what was said concerning antiphlogistic purges in the cure of Inflammation, §. 396. For the like reason they were also recommended in the cure of the Frenzy, §. 781.

3.] For this disease happens to plethoric persons, of a hot constitution, and whose blood is rendered viscid by an inflammatory lentor; and therefore all refrigerating, diluting, and attenuating medicines, are here indicated: but these at the same time are always diuretic. See what was said upon them in the comment to §. 396, n^o 5.

4.] Of these we treated in the comment to §. 1025. But in this case those remedies especially are proper, which, while they make a revulsion from the head, at the same time do not increase the motion of the humours: bathing the feet in warm water, gentle frictions, cupping-glasses, and mild epispastics, are here chiefly recommended. But blistering plasters, as by their acrid stimulus they frequently increase the motion of the humours in the whole body, are here less commended; or if they should be applied, it ought only to be done after the above evacuations have been used.

5.] *Viz.* That nothing should be given, which can either oppress by its quantity, or by its stimulus increase the motion of the blood. But what kind of food that is, and for what reason it is useful, was explained at large in the cure of Inflammation, §. 396, n^o 5.

6.] With what prudence stimulating, acrid medicines ought to be used in a viscid and cold apoplexy, was said in the comment to §. 1029; lest that glutinous matter, being moved and pushed farther into the vessels, should increase the disease. But in that species of apoplexy of which we now treat, these medicines always certainly hurt, seeing they increase both the motion and heat; as was likewise formerly remarked in the comment to §. 1010. N^o III. 1. But in the mean time these are usually recommended as the only remedies among people of high condition; and physicians frequently run a risk of being blamed, if they do not immediately use them even in the most plethoric habits. It likewise often happens, that they have been used very liberally, before the physician was called.

But how hurtful external heat may be in this case, appears from practical observations, mentioned in the comment to §. 1010. N^o III. 1. How, and by what means, the too great heat of the air may be moderated, was said in the comment to §. 605, n^o 2. But as a person is hotter in bed, especially when covered with the bed-clothes; and if at the same time he lies
flat

flat upon his back, the blood must rush with greater violence towards the head; the reason is clear, why sitting erect in a chair is of such service in this case. See likewise what was said upon the usefulness of an erect posture in the cure of the Frenzy, §. 781.

§. 1031. **B**UT if the apoplexy is already come on, there will scarce remain any hope; and that only in using the remedies mentioned in the last aphorism.

For then we know, that in plethoric persons the blood-vessels of the brain are so filled, that the whole common sensory is thereby compressed. A sudden evacuation seems to give hopes of a cure; but while the soft and tender medullary substance of the brain suffers such a strong compression, there is always fear lest it should be already destroyed: besides, in this case, the blood-vessels, being distended above measure in the cavity of the cranium, as they are likewise deprived of these stronger coats, they easily burst; and then they produce a strong and incurable apoplexy, as will be said §. 1033.

But if the blood, rendered thick by an inflammatory lentor, sticks in such a manner in the arteries of the brain, that all the functions of the common sensory are abolished, from the free motion of the humours through the vessels being hindered; it evidently appears, that in this case there must remain still less hope. For frequently the inflammation cannot be so suddenly resolved, as is here required; and, besides the rupture of the vessels, suppuration and gangrene are here to be dreaded as consequent upon the inflammation. Wherefore it is remarked in the history of the Frenzy, that these violent furious fits sometimes fatally terminate in a profound apoplectic sleep: see §. 774.

§. 1032. **B**UT that apoplexy which arises from extravasated fluids, between the
cranium

cranium and the membranes, or between the membranes themselves, from a wound, contusion, fracture, or suppuration, was treated of in speaking of Wounds of the Head (267, 268, 273, to 297.

Of all these we have treated in the numbers here quoted.

§. 1033. **T**HE apoplexy produced from liquids extravasated in the interior cavities of the brain (§. 1010. N^o IV.), and known by its proper signs there mentioned, scarce requires a cure, seeing for the most part certain death presently follows. If any thing is worth trying, the only hope remains, 1. From the resorption of the extravasated liquid into the veins (279, 280.) 2. From correcting the prevailing acrimony and lentor at the same time, which is done most successfully by saponaceous chemical medicines.

Such an extravasation is occasioned, either from the blood-vessels bursting by being distended with too much blood, or from their being eroded by the humours being rendered too sharp. But it is sufficiently evident, how little hopes can remain in such a case; and it appears from practical observations before mentioned, how quickly the patient dies in an apoplexy from this cause. When from an external violent cause the vessels in the cavity of the cranium being broke pour forth their contents, there is hope, by trepanning the skull, of removing them, while they lie between the cranium and dura mater, or between this and the pia mater, which is frequently the case: But if the extravasated humours are accumulated in the ventricles, or in the substance of the brain itself, as has often been observed; they cannot be thence evacuated by this operation, as appears at first sight.

1.] In this case physicians place their only hope, which is very doubtful, in the resorption of that extravasated liquid in the cavities of the cranium. It was proved at the aphorisms quoted in the text, where we treated of the cure of Wounds of the Head, that, by plentiful bleeding and purging, the veins being emptied resorbed the blood extravasated in the cavity of the cranium; at the same time it was then explained, how that resorption was brought about. But a cure can only be hoped for, if the ruptured vessel presently ceased to spue out its blood, and the quantity of extravasated blood was so moderate, that, tho' it might have compressed the brain, it could not altogether destroy it. For as soon as, after plentiful evacuations, some part of the extravasated blood is received again into the veins, the symptoms will begin to be lessened; and then there will arise some hope of a cure. But if the vessels were ruptured, either from a plethora, or from too great a velocity of the circulation, of a sudden such a quantity of blood is poured out, that death for the most part follows before these evacuations can have the effect. Hippocrates indeed observes, that diseases of the head are sometimes cured, if pus, or blood, is voided by the nose, ears, or mouth, as was taken notice of in the comment to §. 275: and therefore it might be surmised whether extravasated blood may not be carried off spontaneously the same way, and so the apoplexy cured; although there are no ways yet discovered by anatomy, by which the humours contained in the cavity of the cranium can thus be sent off; and perhaps in such diseases new ways may be produced, which did not exist before: But I do not know that it has appeared from authentic observations, that an apoplexy, produced from blood extravasated in the cavities of the brain, has been cured in this manner.

2.] But when the acrid humours, having eroded the vessels, are extravasated in the cavity of the brain, the case seems quite desperate. For if good blood extravasated here produces an apoplexy which is hardly curable, what mischiefs may not be expected from such

humours, which, being extravasated, not only hurt by pressure, but likewise suddenly destroy by corroding the tender fabric of the brain? Or if a glutinous humour, accumulated here in the distended vessels, and at the same time endued with some degree of acrimony, by the bursting of the vessels is collected in the cavity of the brain, in this case likewise a cure is hardly to be expected. It is true indeed, that those saponaceous chymical medicines, of which we spoke before in the cure of an obstruction, in the comment to §. 54, 135, are of great efficacy in dissolving glutinous concretions, and might be varied according to the different predominating acrimony: but these act upon such humours as are either still moved within the vessels, or obstructed in the extremities; but hardly appear to be able to produce any considerable effect upon such humours as are already extravasated; and therefore are rather useful in preventing an apoplexy when it is threatened from such a cause, than in curing it after it is already produced.

§. 1034. **T**HAT which arises from extravasated lymph is more easily cured; and without bleeding, which in this case is almost always hurtful. The cure is attempted here by the strongest hydragogues determined to the belly; likewise by dissipating applications; especially by large blisters, kept running a long while; by drying food, strong epispastics, issues, and setons.

But if the apoplexy is occasioned by mere lymph extravasated in the cavity of the brain, then there is more hope. For the thin lymph is much easier absorbed by the bibulous veins, than blood, which even by being extravasated becomes thicker, and which can never be entirely taken up by the veins, unless it is diluted and attenuated by being mixed with the lymph, and this rendered fit for absorption. But as this accumulation of lymph in the cavities of the body happens

pens chiefly to those persons in whom the quantity of red blood is sparing, as was said before in the comment to §. 1010. N^o II. 3. it appears that in this case bleeding must rather be hurtful than of service. It is proper, nay necessary, to make a sudden and plentiful evacuation here; but that humour ought to be evacuated which predominates, and constitutes the material cause of the disease. Wherefore the strongest purges, called *hydragogues*, from the great quantity of thin lymph which they draw off by stool, are here of service; as scammony, jalap, colloquintida, gum-gotta, and the like; which being given in large doses, and frequently repeated, often happily produce large evacuations of lymph collected in the cavities of the body, as will afterwards appear in the chapter upon the Dropsy. Neither are we here afraid to administer the hotter purgatives; because coldness, and want of motion, predominate in such bodies. But in order that the evacuation may be as sudden as possible, it is of very great service, an hour or two after such an hydragogue has been given, to administer a strong clyster, to determine quickly and powerfully the action of the purge downwards. In case the patient cannot swallow the purgative remedy, a quadruple dose of the same injected by way of clyster will produce a similar effect; or in case the clyster should immediately return by the anus, another of the same kind may be immediately repeated. At the same time it is usual to apply to the head, bags of cephalic herbs, *viz.* rosemary, sage, penny-royal, marjoram, wild thyme, &c. which, by their aromatic stimulus, move and incite the humours to circulate more briskly; whence they are called *dissipating* remedies.

Blisters are likewise of the greatest service here, both as they act by revulsion, increase the motion by stimulating, and, by the discharge which they occasion, frequently evacuate an incredible quantity of lymph for several days successively. The same is true of issues and setons, of which likewise we treated before. But dry food is required, together with those evacuants; and ought to be continued a long while af-

ter, that the absorbent veins may be rendered as bibulous as possible, and so more greedily absorb the lymph extravasated in the cavities of the brain. Wherefore the patient's drink ought to be very sparing, and his food of roast meats, river-fish likewise roasted, and biscuit; which diet for the same reason will be recommended afterwards in the cure of the Dropsy.

But as this lymph is usually accumulated by degrees in the brain, hence a future apoplexy from this cause may be foreseen long before it comes on, and therefore may be prevented by proper remedies, as was said before: And, after it is come on, there is much more hope of a cure than in the other kinds of apoplexy.

§. 1035. **B**UT if this disease is produced by poisons, there is no remedy hitherto discovered able to cure it; nor is that kind of it curable which is owing to a polypus.

In the comment to §. 1010. No V. amongst the causes of the apoplexy were reckoned some wonderful poisons, which in a moment, while the body is exposed to the vapour of them, abolish all the animal-functions; nay, sometimes suddenly destroy life itself. This was then confirmed by several practical observations. Neither do I know of any remedy that has been hitherto discovered, which can rescue a person from such imminent danger. But those poisons, which produce an apoplexy while they remain in the stomach, may easily be expelled by a quick vomit, and so the disease be cured. White vitriol, to the quantity of half a drachm, diluted in two ounces of water, or an infusion of tobacco, affords a remedy of this kind, which immediately acts as soon as it has been swallowed. Neither ought those who are rendered apoplectic with the vapour of charcoal, to be left entirely as desperate. For in the example, before quoted from Wepfer in the comment to §. 1010. No V. it appeared, that a person who had lost all his senses from this cause, and had even the apoplectic snoring,

was recovered by means of cold water thrown upon his face and breast. But there is another very remarkable case ^a of a man, who going down to a coal-pit, upwards of two hundred feet deep, was struck down with a poisonous vapour, and remained upwards of half an hour before he could be brought out; and then he lay with his eyes open, his mouth gaping, quite cold, and without either pulse or respiration; whence he was looked upon by every body as dead. A skilful surgeon, squeezing close the man's nostrils, blew air into his mouth as forcibly as he could, and so dilated the lungs; and soon after, applying his hand to his breast, he felt the heart beat six or seven times, but very quick. Afterwards the person began to respire, and in a little time the pulse could be felt in his wrist. Then the surgeon let him blood, which after a small jerk dropt slowly from the vein for a quarter of an hour; but after that time, it flowed very freely. In the mean while he was tossed, shaken, and heartily rubbed, his face and temples were sprinkled with cold water, and sal volatile oleosum applied to his nose and lips. After all this had been continued assiduously and without intermission for an hour, he began to yawn, and to move his eye-lids, hands, and feet; he swallowed sal volatile diluted in water; in the space of another hour all his senses returned; and he owned that he was quite ignorant of every thing that had passed. In four hours time he was so perfectly recovered, that he was able to walk home. This case informs us, that such persons are not rashly to be given over for dead, although no signs of life seem to remain; and it appears very probable, that several have died from the like cause, who might have been saved.

But the apoplexy, which is occasioned by polypous concretions (§. 1010, N° II. 1.), obstructing the arteries which go to the brain, does not admit of a cure; seeing it is impossible to dissolve these obstacles suddenly, or by any art remove them while the patient is alive.

Of the CATALEPSY.

§. 1036. **T**HAT disease in which the patient is immediately struck motionless, insensible, and retains the same posture which he was in the very moment he was seized, is called *Catoche*, *Catochus*, *Catalepsis*, the *Catalepsy*.

Now follows that wonderful disease, which is called *Catoche* and *Catochus*, απο τε κατεχισθαι, *to be detained, occupied*; as likewise *Catalepsis*, απο τε καταλαμβάνεσθαι, *to be caught*; and very justly, because such as are seized with this disease, retain the very same posture which they were in when first taken with it, and in the same manner as the poets have feigned of those who at the sight of Medusa's head were struck stiff, and as it were half dead, with the countenance frowning, and the arm lifted up as if threatening to strike a blow at an enemy. But the chief reason for using the word *catalepsis* now-a-days to signify this disease is, because the name of *catochus* has likewise been applied to the coma vigil, as Ægineta^a has remarked. Nevertheless the ancient physicians, as Galen asserts, called such as were taken with this disease καλοχως, and κατεχομενους; and the later ones name the disease itself *catoche*, and *catalepsis*^b. But Galen^c likewise in another place observes, that all strong and violent diseases whatever were by some called κατοχα νοσηματα: and Hippocrates^d seems likewise to have called those καλοχως παρὰ κρυοντες, who are constantly light-headed throughout a disease; for in a catalepsy a delirium cannot be observed, seeing they neither move the body nor speak. In the comment to §. 774. I made use of that same text of Hippocrates, to confirm that a frenzy frequently terminates in a *catoche*; but the former sense of this text seems to lie under less difficulty, and nevertheless a
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^a Lib. iii. cap. 10. p. 28. vers. 6, et p. 29. ^b In Libello de Pulsibus, ad Tyrones. cap. 12. Charter. Tom VIII. p. 12. ^c Comment. 2. in lib. i. Prædict. ibid. 760, 761. ^d Lib. i. Proreth. ibid. p. 756.

prognostic equally as unfavourable may be deduced therefrom in the frenzy. Indeed the pathognomonic symptom of this disease is, that the patient remains, motionless and insensible, in the same posture which he was in when he was first seized: but in the mean time there are some diversities to be taken notice of here. For the most part, all the joints remain flexible; and in whatever posture the limbs are put, they remain so till they are placed in some other. Thus if the arm, for example, is raised up, it remains raised; or if the fingers are bent or extended, so they continue. They feel nothing, nor do they remember any thing that is done about them, during the paroxysm. But Galen^c relates of one of his fellow-students, who, being over-fatigued with studying, was seized with this disease, that he lay quite stiff like a log of wood, with his eyes open, but without any motion of the eye-lids: he heard however, and remembered some things that passed: he likewise saw; but he could neither speak, nor move any part of his body. Lambecius, when he attended the emperor Leopold in his journey to Inspruck, saw, in a village belonging to the district of Tyrol, “ A
 “ young woman of twenty-five years of age, who had
 “ for some years before, constantly every Friday and
 “ Saturday, but on the other days alternately, and at
 “ certain intervals, being deprived of all sense, with
 “ an universal rigidity of the body, having her eyes
 “ open, and (only with a very gentle kind of convul-
 “ sive motion) lay in the same posture as if she was a
 “ statue; so that when she was pricked with a needle
 “ she felt no pain, nor, when her arms were raised up
 “ by another person, did they fall down of their own
 “ accord, but with a monstrous kind of stiffness re-
 “ mained firm and unmoved in the same posture as
 “ they were left”. In this case the eyes were open, which almost always happens. However, I saw a woman, in the flower of her youth, who was several times seized with this disease, and during the paroxysm had her eyes always shut; and when I opened the eye-lids with my fingers, they presently closed again, although
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^c Ibid.

f Comment. Biblioth. Cæsar. Tom. II. p. 688.

all the other members of the body remained in whatever posture you had a mind to put them. It is still more seldom that any sense remains; yet it was observed in a young girl who was seized with this complaint, that she felt the volatile spirits which were held below her nostrils, and lifting her hand hastily up she laid hold of her own nose and squeezed it. Nay, it was observed in the same girl, that sometimes one side only was seized with a catalepsy^s, which happens still more seldom. Now the catalepsy is hereby distinguished from an universal tetanus, That in this last all the joints are rendered quite rigid, and can neither be bended nor extended by any force; whereas, in the catalepsy, they all yield, with a waxen flexibility as it were, and remain in the same posture into which they are put.

§. 1037. **W**HEREFORE the immediate cause of this disease is an immobility of the common sensory, remaining as it was the first moment of the attack.

In this disease the common sensory is certainly not affected by objects acting upon the organs of the senses; neither does it change the derivation of the cause of muscular motion, as long as the cataleptic paroxysm lasts; but every thing remains perfectly in the same situation. Thus I have seen a woman seized with it when she was standing, in which posture she remained; and therefore all the muscles, which then act in order to keep the body erect, and which are very numerous, persisted in performing their office: And thus this disease differs from the apoplexy; where all the voluntary muscles are rendered paralytic, and the patients fall down, being quite unable to support themselves. We may indeed, at the command of the will, remain unmoved some time in almost any posture, and thus in this manner imitate a catalepsy: but we cannot hinder the organs of the senses from being affected by sensible objects. But the nature of this disease

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is surprising chiefly in this, that all the external and internal senses are abolished, while the efficacy of the cause of muscular motion still remains; but the power of changing the direction of that cause is wanting; whence all the members continue in the same situation which they had the moment that the patient was first seized. In order that this may be the better understood, let us take a view of some surprising circumstances which happen in the exercise of muscular motion. A man proposes to walk, for example, the space of a mile: he sets out from his house, and frequently during the whole walk does not think any more of the motion of his body, which he continues mechanically after it is begun, diverting the tediousness of the journey by conversing with his friends, or by different objects which he meets with which continually raise new ideas in his mind: yet he still walks on, although the will to do this motion is not every moment renewed; and although he has no distinct notion of the cause to which this motion is owing, nor the instruments by which it is produced and continued. But it has often been observed before, that the common sensory is that corporeal organ by which the will of the mind produces motion in the body; if therefore that common sensory is rendered immovable for a moment, and does not transmit the orders of the mind to the body, so to speak, every thing will remain in the same condition as it was before that happened, and this seems to give the best idea of the catalepsy. I knew this happen to a nobleman, who, just as he was going out of a physician's house, whom he had been consulting about his disease, stood fixed on the threshold for some minutes cataleptic; and afterwards, when the paroxysm was over, walked home quite insensible of what had happened to him.

§. 1038. **T**HEREFORE an absolute rest of the blood in the brain, its glands, and emissary vessels, as at the instant when the patient was first seized, is also here implied.

It is demonstrated in physiology, that the structure of the brain ought to be entire, and there ought to be a free motion of the humours through its vessels, in order that the functions of the senses and voluntary motions may be performed; but as these are suddenly abolished in the catalepsy, thence it is taken for granted that all these are at rest in this disease. But in those cataleptic patients whom I have seen, I found the pulse very perceptible in the carotids; neither was the face always turgid and puffed up; nay, in some of them it was rather collapsed: wherefore the blood seems to pass freely enough through the arteries of the brain, and to return by the veins: But the arrest appears chiefly to be in that subtil fluid, which, being secreted by the arteries of the brain, is moved thro' the slender nervous canals, and whose motion depends not upon the heart and arteries, but is produced by the influence of the mind, connected with the body.

For that there is present in cataleptic patients a sufficient quantity of spirits for the motion of the muscles, we know from hence, That the muscles which were in action the moment the disease began, remain so; and in some, after a short paroxysm, the muscular motion returns as quick as before. Another argument, proving the same thing, is, That the limbs of cataleptic patients, if they are bent, or raised up, &c. by the bye-standers, remain in whatever posture they are put, which cannot be done without the action of the muscles. But it was remarked in the physiology^a, when treating of muscular motion, that if any joint of a person is bent by an external force, contrary to his will, the flexor muscles of that joint will swell, grow hard, and protuberate; which is there demonstrated to be owing to the influx of the spirits through the nerves into the muscular fibres. Whence, upon raising the arm of a cataleptic person, we feel the deltoid muscle evidently to swell; and upon quitting our hold, it does not fall down, but by the continued action of that muscle remains lifted up. The same therefore happens in cataleptic, as in sound persons whose limbs

^a H. Boerhaave Instit. Medic. sect. 401. n^o 13.

limbs are moved from an external cause; *viz.* the muscles, which are appropriated to exercise that motion at the command of the will, swell: and therefore, that very subtil fluid, which swells the muscles, and makes them hard, while they are in action, is present; but the power of moving it at the time is abolished.

§. 1039. **I**NDEED, in that disease, all the functions of the brain are hurt, and those which depend thereon; the muscles alone remain in action as in the beginning; besides, the respiration and pulse continue, but for the most part very gentle.

In the perfect apoplexy all these conditions obtain. But as there was a gentler kind of apoplexy, in which all the senses and voluntary motions were not entirely abolished, and yet the disease was called an apoplexy: so likewise there is sometimes observed a gentler species of catalepsy, in which also the motions and senses in some measure remain, as was said a little before; and is confirmed by the testimony of Fernelius ^a who saw a patient of this kind, deprived of all sense, but who breathed easily, and readily swallowed whatever was put into his mouth: being lifted out of bed, he stood upright alone; and walked, when he was pushed forwards. But this circumstance is observed, in all cataleptic persons, that in whatever position the limbs are put by the bye-standers, in that they remain. The vital actions, *viz.* the pulse and respiration, are hardly changed; unless that sometimes the pulse is observed to be weaker, though this does not always happen. The celebrated Hoffman ^b positively asserts, that in a cataleptic woman the pulse was like that of a person in health, and the respiration quite free. But the catalepsy differs much as to the frequency and continuance of the paroxysms: I have seen where it did not last above three or four minutes; and, on the other

^a Patholog. lib. v. cap. 2. p. 90.
Tom. IV. part. iii. cap. 4. p. 151. and p. 132.

^b Medic. Ration. System.

ther hand, I observed before, that a woman remained cataleptic for the space of eighteen hours. Aëtius^c affirms, that a certain youth continued three days cataleptic: But that disease does not seem to have been quite the same with the one which we now treat of, but rather to belong properly to the Frenzy: for he mentions that the pulse was small, and hardly to be felt, in those patients; that they moved their hands to their head, eyes, and nose, groped about the walls &c.; all which symptoms belong rather to the Frenzy, as likewise the crisis of the disease, which happened the fourth day by a plentiful bleeding at the nose. But the intervals between the cataleptic paroxysms are very various: sometimes the disease lies dormant for several months; and, on the contrary, Hoffman^d has observed, that a woman afflicted with this disease, had upwards of a hundred paroxysms in the space of forty days.

§. 1040. **A** TEDIIOUS intermitting fever, especially of the quartan kind; a melancholic, dry, lean habit of body; the menstrua and hæmorrhoids obstructed; violent, and sudden frights; a profound, and long protracted, poring upon one object; violent fevers in persons of a sanguine constitution; for the most part precede this disease.

As this disease is so surprising; and, sometimes when the paroxysm goes off, immediately all the functions are restored quite entire^a; and as the common sensory may be disturbed by such latent causes; it undoubtedly requires great attention to determine any thing certain concerning the causes of this disease: but that investigation will be most successfully set about, by collecting together, from undoubted observations, those changes of the body which usually precede the catalepsy; then, by adding those phenomena, which have

^c De Re Medica, lib. vi. cap. 4. p. 101.

^d In loco modo citato.

^a Ibid.

have appeared upon dissecting the bodies of persons who have died of this disease; and lastly, by observing what remedies have been of service in it. For, from all these, compared with one another, both the causes and indications of cure may be discovered.

But in this aphorism those things are enumerated which usually precede the catalepsy. And first,

A tedious intermitting fever, &c.] That by tedious intermitting fevers the vessels are weakened, and the fluids rendered morbid, from the aliments not being sufficiently assimilated; and the blood, being deprived of its finest and most balsamic parts by sweats, is rendered thick and acrid; was fully explained in the comment to §. 753, where we treated of the bad effects of intermitting fevers. But that the functions may be disturbed from such an enervation of the solids, and a cacochymia of the humours, easily appears; and we know from certain observations, that the actions of the brain are sometimes thereby hurt, as will be said afterwards in the comment to §. 1125, where we shall treat of a kind of madness succeeding a violent and tedious autumnal intermitting fever. Nay, Dodonæus^b observed a catalepsy in the very paroxysm of an intermitting fever. But as it will be remarked in the following paragraph, that in the bodies of those who have suffered this disease, upon dissection there has been found a thick blood, strongly impacted in the vessels of the brain; and as by tedious intermitting fevers the fluid parts of the blood are dissipated, whereby what remains is inspissated; the reason appears, why these fevers are reckoned amongst those appearances which commonly precede the catalepsy.

A melancholic, &c.] Because in such a habit of body, both the vessels are straitened, and the humours by their atrabiliary tenacity cannot so easily circulate; hence they will readily obstruct the vessels of the brain, and so disturb the common sensory, and produce a catalepsy; which will likewise be confirmed, by what we shall say under the following aphorism. Besides, it seems very probable, that a catalepsy may likewise

be produced, although the material cause of the disease does not lodge in the brain, but in some other part of the body. It was fully proved before, in the comment to §. 701, that a delirium is produced in fevers when there is putrid bile lodged in the bowels. Further, it will appear afterwards in the chapter upon Melancholy, that the common sensory is surprisingly disturbed from black bile loading the abdominal viscera; and that it is usual for melancholic persons constantly to pore upon one and the same thought; which long-protracted thinking upon one object is reckoned amongst the causes of the catalepsy in this very aphorism. But the following case seems to teach us, that a catalepsy may certainly arise from causes which are placed without the brain. A woman forty years of age, and of a lean habit of body, roasted chestnuts in a frying pan, and kept continually stirring them with a wooden ladle lest they should be too much scorched: in doing of which, she was seized with a true catalepsy. As I lived in the neighbourhood, I was immediately called; and while I was there, she suddenly vomited up two live round worms: and presently she proceeded on in the work she had begun, quite unmindful of what had happened. Several years after I saw her in good health, and she had never suffered any thing of the like complaint afterwards. But those worms, irritating the stomach by their crawling motion, without doubt produced that fit of the catalepsy; which therefore immediately ceased, as soon as they were thrown up.

The menses and hæmorrhoids obstructed.] That the hæmorrhoids are of service in curing diseases of the head; and, on the contrary, that all kinds of complaints of the head may be produced from a suppression of the hæmorrhoidal discharge; we have had frequent occasion to mention: the same is likewise true of the menses when they are obstructed. For we see a great many girls and women, about the time of the menses, complain of pains in the head, stiffness in the neck, giddiness, &c. all which complaints cease as soon as the menses flow properly. I have seen a girl
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who every month, two days before the menses appeared, had a swelling arise in the back part of the head about the size of an hen's egg; and upon the flowing of the menses, that tumour suddenly disappeared. If such a thing had happened in the inside of the head, what mischief might it not have produced. Hippocrates ^c has mentioned several complaints of the head, near akin to this, arising from the same cause, viz. that the blood wanting to escape by the uterus, and not finding a passage, it regurgitated upwards. That wonderful species of catalepsy which was mentioned in the comment to §. 1036, happened to a virgin labouring under a suppression of the menses^d.

Violent and sudden frights.] In what surprising ways the human body may be changed by violent affections of the mind, has been said upon another occasion in the comment to §. 104; and at the same time it appeared, that these changes are various, according to the different affections of the mind. In a violent fright, a man is affected in the same manner as in a catalepsy; for he is stupefied, struck dumb, and motionless: whence, if that affection of the mind happens to be very powerful, this impression remains, and a perfect catalepsy is produced. Tulpius ^e relates a case of this kind, of a British youth, who was so violently shocked with an unexpected repulse in marriage, that he was immediately seized with a catalepsy, and remained a whole day in the same posture, with his eyes open, resembling a statue rather than a man. But when they called out to him aloud, that he should enjoy his wished-for spouse, he immediately jumped off his chair, quite free from the disease.

A profound, long protracted, &c.] When men of learning are deeply immersed in profound meditation, they then perfectly resemble cataleptic persons: for all the senses are quiet; the memory for the time is quite effaced; the whole body is entirely at rest; and the mind, retired into its innermost recess, is wholly

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^c Libro de Virgin. Affect. Charter. Tom. VII. p. 679, 680.

^d De la Mettrie loco ibidem citato.

^e Observat. Medicar. lib. i.

cap. 22. p. 45.

intent upon one and the same object: This they have called ecstatic thinking. Thus Vieta, wholly collected within himself, deciphered letters to the king of France, which were wrote in unknown characters; but during all this time, while he was engaged in this difficult task, being wholly bent upon that one subject he was quite deprived of feeling and motion. I have seen a very ingenious mathematician, who, while he was resolving some hard problem in his mind, never saluted any body as he was walking along, although he was a very well-bred man; and I have known another, who, on meditating very intently upon a discourse which he was to deliver in public, wandered out of his road a whole mile from the place whither he intended to go, and the way to which he was well acquainted with. By that eager attention of the mind great proficiency is made in study; but at the same time the common sensory is thereby, as it were, so fixed, that hence a disposition to a catalepsy is brought on. Galen ascribed this disease in his fellow-student to too much study, (see §. 1036): Fernelius saw another, who, “ while he was applying very close to
 “ study and writing, being suddenly seized with the
 “ catalepsy, his body became so stiff, that he was
 “ found sitting with the pen in his hand, and his eyes
 “ fixed upon the books, so that he was thought to be
 “ studying of them, till being called and shook he
 “ was found to be void of all sense and motion f.” Neither is the catalepsy to be feared by those only who emaciate themselves with too much study; according to the celebrated Hoffman g, who observed this disease in a woman of low condition, and void of education, who being consumed with anxious thought about sacred affairs, fell into this disease, and suffered several paroxysms afterwards upon hearing of psalmody, or especially texts of scripture which expressed an ardent love of Christ.

Strong fevers, &c.] It was proved in the comment to §. 1010. No III. 1. that, in plethoric persons, the blood

f Patholog. lib. v. cap. 2. p. 70.
 Tom. IV. part. iii. cap. 4. p. 150.

g Medic Ration. System.

blood being rarefied by a febrile heat, and at the same time increased in its motion, may so fill the larger vessels of the brain, that the lesser ones may thereby be compressed; and thus therefore all the functions of the brain may be hurt from this cause. To this cause seems to belong that species of catalepsy of which Aëtius took notice (see §. 1039), and which was cured by a plentiful bleeding at the nose. In acute and inflammatory diseases, we sometimes see the patients lie with their eyes open, and insensible, as if they were cataleptic; and it is a bad sign: which Hippocrates has likewise remarked, saying, *If they are fatigued, troubled with a hickup, and cataleptic, it is a bad sign*^h. I have frequently seen patients lying so in acute diseases; but if their limbs were raised up, or bended different ways, they did not remain in that posture: hence I cannot affirm, that I have observed a true catalepsy in patients labouring under an acute disease. Neither does that case of Aëtius resemble the true catalepsy in every circumstance. Perhaps Hippocrates means this, when he says, *Convulsions, tremblings, and restlessness, with a slight catalepsy, prognosticate abscesses about the ears*ⁱ. For while the morbid matter in acute fevers is determined upwards by metastases, the functions of the brain are usually hurt; which are restored anew, if all this matter, falling upon the parotids, raises them into a tumour: whence, before this congestion is made, a catalepsy is sometimes produced, but not a perfect one; and therefore Hippocrates has called it a *slight* or *gentle* catalepsy. However, I dare not absolutely say, that a true catalepsy does not happen in acute diseases; but I should imagine it must only be seldom.

§. 1041. **T**HE bodies of persons who have died of this disease being opened,
Q 3
the

^h Lassati, singultuosi, et catoche correpti, malum. *Coac. Praenot.* n^o 45. *Charter. Tom. VIII.* p. 855.

ⁱ Convulsio, tremor, jactatio, cum parvo catoccho, circa aures abscessus proritant. *Prædic. lib. i. ibid.* p. 805.

the arteries and veins of the brain have been found quite turgid with a very thick blood.

No body doubts that the dissection of dead bodies is of very great service towards discovering the causes of diseases: but, in the mean while, there is great need of caution here, lest that should be taken for the cause, which is rather the effect of the disease; for many things are found changed in the dead body by the disease itself, which did not subsist before it happened, as was remarked formerly, in the comment to §. 11. Hollerius asserts, that in the dead bodies of those who were carried off by a catalepsy, he had found “ the larger veins, which run straight from the forehead
“ to the sciniput, full of a thick coagulated blood, and
“ the hind part of the brain filled with a serous matter ^a.” In another person, who died of a catalepsy, “ there was found a reddish serum contained in
“ the posterior part of the brain, and concreted blood
“ in the great vein which runs along the middle of
“ of the head ^b.” But it does not appear, that we ought to conclude from these observations, that such causes are always present in the catalepsy. For if a repulse in matrimony only (see §. 1040.) was able to produce this disease in a very healthy man, it seems as if it might be occasioned by causes much more subtile than the above. Besides, by means of the will, a person can counterfeit the catalepsy, and retain all his limbs in the same posture which they had at first: But however latent and effectual that cause may be, upon a change of the will it is immediately removed. Farther, several persons have recovered from this disease, as will be said afterwards; whereas the removing of those causes, which have been found in dead bodies, seems to be no such easy matter. Indeed it cannot be denied, that blood concreted in the vessels of the brain, and liquids extravasated in the cavity of the cranium, may occasion a catalepsy; but it is no less certain, that this disease has been produced without these causes.

It

^a Comment. in Coac. Hippocr. p. 66, 326.
Morb. Intern. lib. i. cap. 9. in Scholiis, p. 60.

^b Hollerius de

It appears from what was related under the preceding aphorism, that worms irritating the stomach have produced this disease; and Galen has the following remarks: *So likewise in some are produced the epilepsy, carus, coma, catalepsy, and melancholy, from a weakness in the stomach, the common sensory of the brain being drawn into consent* ^c. This required to be remarked chiefly upon this account, lest any one should think, that, in the method of cure, those causes only were to be attended to, which appeared upon the inspection of bodies who died of this disease.

§. 1042. **I**T is frequently cured by a plentiful bleeding at the nose.

Viz. If this disease is produced from the blood vessels of the brain being too much distended, or from other evacuations of the blood being suppressed. That catalepsy, which is mentioned from Aëtius in the comment to §. 1039, was cured by a bleeding at the nose.

§. 1043. **I**T seldom terminates in other diseases; yet sometimes the epilepsy, convulsions, madness, and atrophy, succeed it: frequently it ends in death.

I have both seen from practical observations myself, and it appears from undoubted observations of celebrated physicians, that a great many have recovered of this disease, and afterwards enjoyed a perfect state of health; which seems chiefly to happen when persons have fallen into it from a violent affection of the mind, long-continued lucubrations, or some usual evacuation being suppressed. For if those commotions which are excited by affections of the mind are quieted, and the causes which excited them be shunned, the body refreshed

^c Sic igitur et epilepsiæ ob stomachum imbecillum quibusdam suboriuntur; et carus, et comata, et catalepsis, et melancholiæ, consentiente principio, quod in cerebro et nervis est. *De Symptom. Caus. lib. i. cap. 7. Charter. Tom. VII. p. 60.*

freshed with wholesome exercises, peace restored to the mind, and the suppressed evacuations to the body; then the disease usually decreases by degrees, and at last is entirely cured. The same holds true, if a catalepsy is produced from worms; for then, these being expelled, it ceases. But if it is occasioned by humours extravasated in the cavity of the cranium; then by their increase, or acrimony occasioned by their stagnating, other diseases of the brain arise, and sometimes even accompany the catalepsy. Thus Hollerius asserts, that he saw a person who was seized with a coma, epilepsy, convulsions, and catalepsy, alternately ^a. Dodonæus ^b relates from Benivenius the case of Jerome Bencius, who, after the catalepsy, fell into an incurable epilepsy. He has like another case, of a fat, plethoric, elderly woman, who was seized with the catalepsy, and was happily cured by bleeding in the feet, and an acrid clyster administered at the same time: but as she would not submit to any remedies afterwards, by which that dangerous plenitude might be lessened, and prevented for the future, in three months after she fell into a kind of lethargy; and a slow fever coming on, she died in a profound sleep ^c. But the catalepsy seems to be succeeded by an atrophy in melancholic persons, who are frequently very much emaciated; and likewise in those who are subject to worms, *viz.* when the chyle is consumed by them: But ofteneft of all, if an obstinate nausea follows a catalepsy, continuing for several weeks; as happened to two cataleptic patients, whose cases the celebrated Hoffman ^d has transmitted to us; both of whom, however, recovered of the disease, altho' in one of them a delirium, convulsions, and hickup, preceded the cataleptic paroxysms.

But observations teach us likewise, that the catalepsy sometimes terminates in death. Jacotius affirms, “ that
 “ he saw a poor old man, very much emaciated, taken
 “ with this disease, sitting at table, with his eyes open,
 “ his

^a Comment. in Coac. Hippocrat. p. 66.
 p. 146. ^b Ibid. cap. 5. p. 10.
 Tom. IV. part. iii. cap. 4. p. 147;—152.

^b Medic. Observ. cap. 46.
^d Medic. Ration. System.

“ his body firm and upright, reaching his hand to a
“ plate: so that after he was dead, he seemed as if he
“ was alive and at dinner ^c.” And Hollerius has the
following, “ A simple catalepsy carried off a strong
“ man; and I have only seen one who has perfectly
“ recovered of it ^f.” But it is to be remarked, that
he is there commenting upon that aphorism of Hip-
pocrates, which condemns the hickup, lassitude, and
catalepsy, as bad omens: but it appears sufficiently
plain, that he treats there of the catalepsy which hap-
pens in acute and inflammatory diseases; and which
then is justly looked upon as the worst sign, as it shews
that the force of the disease is determined to the brain.
Therefore it cannot be denied, that sometimes the ca-
talepsy terminates in death: but at the same time it
appears from certain observations, that many recover
of it, and without any other disease following it; but
that in some, though not so many, it has terminated
in the epilepsy or convulsions.

§. 1044. **T**HE cure must be varied according
to the variety of the cause. By
rousing the patient by means of such objects as
act powerfully upon the organs of the senses,
such as light, sound, a stimulus, acrid volatile salts,
pain, friction, and continued motion; by promo-
ting an hæmorrhage from the nose; by encoura-
ging the hæmorrhoidal or menstrual discharge; by
sternutatories, vomits, blisters, issues, setons, and
a moistening diet.

The cure of this disease is two-fold, *viz.* either in
the time of the paroxysm, or after it is gone off.
While the paroxysm continues, physicians used to try,
by means of some acrid stimulus, or objects acting
strongly upon the organs of the senses, to change that
disposition of the common sensory which is present at
that time, and suppresses every action of the senses.
But here likewise proper caution is required, as was
said

^c Holler. Comment. in Coac. Hippoc. p. 68.

^f Ibid. p. 66.

said before in the cure of the apoplexy: and Hoffman^a has prudently advised, to abstain from the hotter stimulating medicines, if the catalepsy has arisen from too great an orgasm, expansion, and stagnation of the humours. Neither does the use of the like medicines seem safe in hysteric persons, who are seized with a catalepsy; for when such powerful stimulants happen to rouse the patients, they occasion strong convulsions, which are equally to be dreaded, and perhaps more hurtful than the catalepsy itself^b. Nay, for the most part they have but little effect; which I have learnt both from my own observations, and is confirmed by others mentioned in the works of the Royal Academy at Paris^c. For upon placing fire under the feet of a cataleptic woman, she was not roused from the paroxysm. Hence, when gentle stimulants and frictions have no effect, I should hardly advise stronger remedies to be used. For the common sensory being quite oppressed, they are of no service, and frequently by their acrimony very much hurt the organs of the senses; or in case those very acrid stimulants happen to rouse the patients, they frequently at the same time surprisingly disturb and irritate the whole nervous system, especially in hysteric and hypochondriac persons: which is not unattended with danger.

In the absence of the paroxysm, the cure ought to be varied, according to the diversity of the disease. For if it is owing to too great a quantity, or a rarefaction, of the blood, bleeding is of service; and it ought to be repeated several times, if occasion requires: If it is produced from a suppression of any usual hæmorrhage, that ought to be promoted by proper remedies. We treated before in the comment to §. 741, 779, of those circumstances which ought to be observed in promoting a bleeding at the nose; as likewise of the signs which prognosticate that hæmorrhage. In what manner the hæmorrhoidal flux is to be promoted, was explained at §. 889, no 2.; concerning the cure of a suppression

^a Medic. Ration. System. Tom. IV. part. iii. cap. 4. p. 145.

^b De la Mettrie Abrege de la Theorie Chymique, p. 280.

^c Hist. de l'Acad. des Sciences, l'an 1738. p. 56.

pression of the menses, we shall treat afterwards under the Diseases of Virgins. Bathing the feet in warm water, espispastic or aromatic plasters applied to the soles, frictions of the legs and feet, will always be of service in such a case, seeing they divert the force and quantity of the humours from the upper parts of the body.

But in a melancholic, dry, and lean habit of body, evacuations of blood would be hurtful; these will find service from a moistening diet, and mild resolvents, of honey, whey, fruits, &c. of which we shall speak more at large afterwards in the chapter upon Melancholy. Spirituous remedies will likewise frequently be of service to these, especially if the body grows torpid with old age. In a nun seventy years old, this disease was cured by spirit of wine, rendered very pure by repeated distillation^d; upon taking of which she immediately recovered her senses; nor had she need of any other remedy, besides those which are calculated for cherishing old age. So likewise if a catalepsy happens to a person exhausted after tedious intermitting fevers, refreshing, restorative, and cordial remedies only are useful; all evacuants are very hurtful, as will be shewn afterwards in the comment to §. 1126, where we shall treat of Madness arising from the same cause.

But when a catalepsy arises from strong affections of the mind, or profound and too long protracted meditation, then it has been observed, that such a disposition has remained in the common sensory, as to renew the disease from a like cause, altho' much slighter than that which produced the first paroxysm. Thus we read in Rondeletius^e, of a young woman who, being obliged to marry a youth whom she did not love, in eight days after her marriage was seized with a catalepsy from grief; and the paroxysm returned whenever she thought of her husband. In that patient likewise, whom I mentioned from the observations of the celebrated Hoffman, the cataleptic fit returned upon hearing the psalmody, or any passage in the sacred scrip-

^d Dodon. Medic. Observ. cap. 6. p. 2.
Morb. lib. i. cap. 20. p. 98.

^e Method. Curand.

scripture which expressed an ardent love of Christ. The best remedy, nay the only one, in such a case, is, by travelling about daily, to divert the mind with a variety of objects; carefully avoiding such as can raise strong affections, or produce close and tedious poring upon the same object. Hoffman ingeniously confesses, that after trying various, and the most exhilarating remedies, the disease still remained; but by changing the air, and making the patient travel about from place to place, it gradually went off. That cataleptic woman likewise, whose case was before mentioned from the works of the Academy of Sciences at Paris, who came to Paris, and from great anxiety about her plea, upon the issue of which her fortune depended, fell into this disease; after returning home to her friends, lived quite healthy and free from this complaint. For it seems in such a case, that hereby that impression upon the common sensory, by which the disease is renewed by any supervening procatartic cause, is gradually effaced.

Such remedies as promote sneezing are usually recommended as most powerful for rousing the patient in the time of the paroxysm; but Heers^f, after rubbing the nostrils of a cataleptic capuchin, blew up a strong sneezing powder without success. However, when he recovered himself, he began to sneeze, and voided up a large quantity of phlegm. If such an evacuation should be indicated from the cause of the disease being known, these remedies might be useful; but otherwise they hardly appear to be of service.

Vomits are then of use, when there is a just suspicion that the fomes of the disease is lodged about the stomach. But it was observed, in the cure of the Apoplexy (§. 1026.) what caution was required in exhibiting vomits in diseases of the head; and there likewise (§. 1025.) we treated of the use and efficacy of blisters, issues, and setons, from the like causes.

Of

^f Observ. Medic. lib. i. obs. 3. p. 40.

Of a C A R U S.

§. 1045. **A** CARUS is a kind of gentle apoplexy, like a very sound sleep, attended with a fever, arising from causes chiefly compressing the brain, which continues sound, (1010. N^o III. 1, 2, 3, 4.); or from obstructing causes, but such as are more easily removed than in the apoplexy (1010. N^o II. 2, 3.) In this disease there remains some perception, but momentary; some sense, but very small.

Before I come to treat of the Carus, I have a few observations to premise, viz. That various names have been given to sleepy diseases both by the ancient and modern physicians; but that they are not always consistent with themselves in the use of those names, (for example, take that passage of Galen which is next quoted at the letter *c*): wherefore it may be worth while to distinguish them somewhat more accurately, and according to their usual acceptations. Our natural rest is called *sleep*; which is longer, or shorter, more or less sound, frequent, or the contrary, according to the causes which have preceded it, and the habit and custom of the person; neither can it be restricted to certain limits, nor indeed is it necessary for our present purpose. It is sufficient to know, that if it evidently exceeds the usual bounds, it ought to be looked upon as a disease. But there are observed various degrees of this excess. If a person is very sleepy, and almost constantly nodding, but frequently awakes of himself, and is easily roused by external causes, and then, at least when he is conversing with his friends, he remains awake and sensible, this is called *coma*. But if he is so sleepy as to become stupid, and almost unmindful of every thing, and is likewise subject to a cold phlegmatic cacochymia, it is called a *lethargy*; which may likewise be distinguished into

various degrees. But if he hardly ever awakes of his own accord, and is roused with much more difficulty by external causes, and almost instantly falls asleep again in spite of all that can be done to prevent it, and at the same time is not subject to any cold phlegmatic cacochymia, it is called a *carus*. If neither of his own accord, nor from the most powerful external causes long applied, he can be farther roused, than only to give some very slight signs of sense and motion, this is named *parapoplexia*. If he gives no signs at all of that kind after the like causes have been applied, and at the same time has all his limbs paralytic, it is termed an *apoplexy*. These things being premised, I return to the *Carus*.

The head by the ancient Greeks was called *καρῆ*; and by apocope, *καρ*. Hence *carus* is taken for a disease of the head, in which the patients sleep profoundly, and can hardly be awaked; but when they are roused by a strong stimulus, they open their eyes for a moment, and immediately drop into a sound sleep as before. This disease resembles the apoplexy, and is as it were a gentler species of it: from which however it ought to be distinguished, because it is cured more easily, and indeed entirely; which seldom happens in a perfect apoplexy; for if the patient escape from this, there is almost always left some hurt in the animal-functions, (see §. 1018.) Duretus^a and Jacotius^b have remarked, that in a *carus* the respiration is more easy, and not attended with such snoring as in a perfect apoplexy. But as a perfect and strong apoplexy for the most part arises from liquids extravasated within the skull, the *carus*, being frequently curable, seems rather to be produced from the large vessels being distended, whereby the smaller ones are compressed. Hence, in the full height of intermitting fevers, the patients sometimes lie in a very sound sleep: and the same is observed after excessive drinking, so that they are often looked upon as apoplectic by unskilful persons; and I have several times seen ignorant boasters in physic ascribe to themselves the praise of curing an apoplexy, while:

^a In Coac. Hippoc. p. 99.

^b Holler. Comment. ibid. p. 280.

while that profound sleep was owing only to a debauch of eating, and especially of drinking. Heers^c rescued a man, who had slept four days after a fit of drinking, from being trepanned, which two surgeons were going to set about, having shaved his head, believing him to be apoplectic, while he had only fallen down the first time of his being drunk: but he examining the person's head, observing no signs of any hurt upon it, and finding his pulse very good, and the respiration quite free without any snoring, positively denied that he was apoplectic; then pulling him by the mustaches, the man awaked in a very great passion, threatening the physician violently if he pulled his beard any more.

It is likewise with difficulty distinguished from a lethargy, of which we shall treat soon: at least we shall see, that Galen has promiscuously called the *lethargy* and *carus* the same disease. The passage runs thus: *But as in lethargic complaints the brain is both moistened and cooled by phlegm, a coma will be produced; which, if you please, you may likewise call a carus*^d. But as in the text a *carus* is also said to arise from obstructing causes, but such as are more easily removed than in the apoplexy, and §. 1010. N^o II. 3. is quoted, which treats of a cold phlegmatic cause of the apoplexy; it is plain, that the disease which is called a *carus*, is sometimes owing to the same cause as the lethargy, (see §. 1049.)

Perhaps, for the sake of mere distinction, the name of *carus* might be retained to signify a profound sleep in acute fevers, and in other diseases, where there is too great a quantity of the blood, too much rarified, or having an inflammatory thickness: But it might be called a *lethargy*, when such a profound sleep is produced from a mere glutinous and inert indisposition of the blood. Ægineta^e seems to have hinted at this, when,

^c Observ. Medic. lib. i. obs. 19^a p. 178.

^d Quum vero cerebrum ob pituitam tum humectetur, tum refrigeretur, in lethargicis affectionibus, coma erit; quod et ipsum, si lubet, carum vocare poteris. Comment. 2. in lib. i. Prædict. p. 743. Charter. Tom. V. Ell.

^e Lib. iii. cap. 9. p. 28. versa.

when, treating of both these diseases, he says, 'That a fever, and of the violent kind, precedes a carus, but follows a lethargy. But he will have the same morbid matter to obtain in the carus as in the lethargy: which he says has the same seat as the phrenitis, viz. the brain; but that the morbid matter is very opposite. But it is very well known, that a glutinous and cold cacochymia of the blood is opposed to an inflammatory and hot thickness of it. In the meanwhile he adds, that a carus frequently comes upon the back of fevers, and compressions of the brain; and therefore he seems to acknowledge that a carus may be produced without a cold phlegmatic lentor of the blood.

But as a carus arises from the like causes with the apoplexy, only more gentle, it does not seem to be void of danger, although it is so frequently cured: and hence Hippocrates ^f seems to have pronounced, *Sopor* (το καγων) *ubique malum*, "That sleep is always a bad omen." Yet in another place ^g he puts it by way of question: *Sopor an ubique malus?* "Is sleep always a bad omen?" And justly, because it does not seem absolutely to be always a bad sign: which Galen ^h likewise confirms, asserting that he has seen patients, who, after watching three or four days successively, have fallen into a profound sleep, from which they could hardly be roused; and have slept for a whole week, which has refreshed them very much. And he has frequently observed children sleep in that manner for two days, and have been much the better for it. Hence, when a carus comes on after long watchings in diseases, or very great fatigue, it rarely prognosticates any mischief, and for the most part is of service. If it takes its rise from drunkenness, sometimes, but very seldom, it degenerates into an apoplexy; and almost only after excessive debauches in eating, or hard drinking long continued. But when a carus is produced from the vessels of the brain being obstructed by too thick

^f Coac. Prænot. n^o 179. Charter. Tom. VIII. p. 861.
^g Prædict. lib. i. Ibidem. p. 743.
^h Comment. 2. in lib. i. Prædict. Ibid.

^g Præ-

^h Comment. 2. in lib. i. Prædict.

thick an humour, or distended by too great a quantity or rarefaction of the blood, it is not without danger: although at the same time, if proper remedies are timely applied, it may be cured; nay, sometimes it goes off of itself after a while, as we shall see presently.

§. 1046. **H**ENCE after a carus the patient is restored to health, unless perhaps a nodding of the head remains for some time.

As in this disease the brain is found, and but gently compressed, by the quantity of liquid distending the larger vessels being taken away, or a due fluidity restored to the blood circulating with difficulty through the vessels to the brain, the functions will return to their former perfection; which rarely happens after the cure of an apoplexy, as was observed a little before. But the reason why an apoplexy, if it is any way violent, almost always leaves some complaint behind it, was given in the comment to §. 1018. Sydenham^a saw such an epidemic constitution, amongst the symptoms of which a carus was eminent, *viz.* a very profound sleep, sometimes protracted for several weeks, from which the patients were roused with the greatest difficulty, and immediately after relapsed into sleep. But, after the force of the fever was reduced to a due moderation by means of gentle bleeding and clysters, they almost all escaped, the disease going gradually off: “But in those who were recovering, the head remained for some days weak and nodding; and there were likewise other symptoms, which shewed that this part had suffered a great deal. But in proportion as the patient recovered strength, the above symptom disappeared of itself.” But in that epidemic constitution, younger persons were more subject to a delirium, but of the quiet kind, and it never arose to a frenzy: hence it appears, that in this disease the morbid matter, occupying the brain, either by compression deadened the actions of the common sensory,

only less than in the apoplexy; or else by irritating disturbed them, but more gently than in the frenzy; and hence it is again confirmed, that a carus is a gentle kind of apoplexy.

§. 1047. **T**HE cure is to be taken from that of the apoplexy before explained (1020 to 1036.)

It appears sufficiently evident from what has been said, that what has been delivered in the cure of the apoplexy must be applicable here. But as the danger is not so immediate in the carus, hence we are not in such a hurry in applying the principal remedies, as we ought to be in the apoplexy, where there is so much risk run by delay. After moderate evacuations, those remedies are chiefly to be insisted upon which derive the force and quantity of the humours from the head; such as clysters, epispastics, and bathing the feet in water; and great care must be taken that the patient may get out of bed every day, at least for some hours, and sit upright in a chair; or, if he is too weak for that, he must lie upon the bed with his clothes on, and his head raised pretty high^a. In the mean time his diet should be thin, and all heating and irritating medicines must be avoided. By this method Sydenham observed that the disease gradually went off; and that it was better for the patients, if it was left thus to take its course, than if any kind of violent evacuation was made at that time, after the fever had been reduced to that just moderation. But of this moderation of a fever, you may see what has been said in the comment to §. 610. In the mean while, you must take care, by changing the situation of the patient's body frequently, and laying an allumed sheep-skin under him, to prevent a mortification by lying; concerning which, see the comment to §. 422, n^o 8.

§. 1048. **T**HE Coma Vigil, Coma Somnolentum, and Cataphora, seem only to be

^a Ibid. p. 282.

be more gentle species of the carus (703, to 710.)

It appears from what was said in the comment to §. 1045, that the ancient physicians sometimes called the same disease, both *coma*, and *carus*. But if we compare what was before remarked in the paragraph here quoted, it will appear, that the carus is very much akin to those diseases, and only differs from them in degree.

§. 1049. **B**UT a Lethargy is a gentler kind of apoplexy, produced from a cold, viscid, moist cause: whence the knowledge and cure of it is to be learned from the history of the apoplexy (§. 1008, to 1036.)

Forgetfulness is called by the Greeks *ληθη*; he who leads an indolent and idle life, is called *αεργος*: and therefore the lethargy signifies a slow and indolent forgetfulness. The ancient physicians ^a reckoned a cold and inert phlegm, when it occupied the brain, to be the material cause of this disease; and the diagnostic signs which they gave of it ^b confirm this: for they describe lethargic persons, as pale, bloated, and wan, with a swelling below their eyes, a difficult respiration, and a slow pulse; all which signs indicate that kind of cacoehymia: and therefore the lethargy seems rather to belong to the class of slow diseases. But as it often ends in the apoplexy, which is suddenly mortal; and sometimes such a lethargic sleepiness succeeds an acute frenzy, (see §. 774.); the ancient physicians have almost unanimously agreed to rank the lethargy with acute diseases. Whence Celsus treating of the lethargy says, that it is the reverse of a frenzy, but nevertheless acute; and that unless it is taken in time, it suddenly kills: and he seems to have deduced that opposite nature of those diseases from the diversity rather

^a Aegineta, lib. iii. cap. 9. p. 28. versa. ^b Hippoc. Coac. Prænot. n° 104. Charter. Tom. VIII. p. 359. Cœlius Auresian. Acut. Morbor. lib. ii. cap. 11. p. 76.

ther of the symptoms, than of the morbid matter. For he expresses himself thus: *In that disease* (viz. the frenzy) *sleep is hard to be procured, and the mind is prone to every audacious action: in this* (viz. the lethargy) *the patient is forgetful, and it is almost impossible to keep him awake* ^c. Hippocrates ^d likewise observes, that the former physicians reckoned a lethargy amongst acute diseases: and elsewhere he remarks ^e, that a lethargic person dies in seven days; and escapes provided he gets over that time. Aretæus also, and Cœlius Aurelianus, have treated of the lethargy, in those books which they have written upon acute diseases.

As therefore the lethargy usually precedes the apoplexy (see §. 1010, N^o II. 3.) and is as it were a gentler species of it, it appears that we have already treated of the cure of this disease.

Hither may be referred a sleep protracted for several weeks, and sometimes months, from which it is impossible to rouse the patient. I have known several cases, where persons have cunningly counterfeited sleep, on purpose to get money from such as came to see them; but at the same time there are instances of such cases in physical writers, where there could be no reason to suspect any imposition.

A middle-aged man from a sudden fright after a fit of anger fell into such a sleep; and being brought into the hospital, he remained for two whole months in the same condition, even after the most effectual remedies had been tried. The two following months he seemed at certain intervals to perceive and know persons that were about him. Upon being suddenly plunged into cold water, he opened his eyes, but did not speak. However, he gradually returned to himself, and recovered every day ^f. Celsus ^g has recommended sprinkling the body with cold water, as the most effectual remedy for rousing lethargic patients. There
is

^c In eo (phrenitide) difficilior somnus, prompta ad omnem audaciam mens est: in hoc (lethargo) marcor, et inexpugnabilis pene dormiendi necessitas. *Lb* iii. cap. 20. p. 158.

^d De Victu Acutor. Charter. Tom. XI. p. 5.

^e De Morbis,

lib. ii. Charter. Tom. VII. p. 577.

^f Acad. des Sciences, 1713.

Mem. p. 419.

^g Lib. iii. cap. 20. p. 159.

is likewise another case of such a profound and long-continued sleep, still more surprising than the above^h. A healthy, strong man, five and twenty years of age, without any known antecedent cause, fell into a sleep, and could by no means be roused out of it for a whole month: then awaking of his own accord, he put on his clothes, and went about his usual work. About two years afterwards he fell into the same kind of sleep; and although bleeding, scarifications, cupping, and blisters, were used, he remained in this condition for seventeen weeks; and then he awaked of himself, and could not be persuaded that he had slept so long a night, till he saw how nigh the harvest was at hand, remembering very well that he fell asleep in seed-time. A year after this he fell asleep again, and slept still longer. A skilful physician, suspecting a fraud in the case, amongst other attempts to awake him, took the sharpest spirit of sal armoniac, prepared with quicklime; and not only held it under his nose, but poured about the quantity of half an ounce into it: then he filled the same nostril, into which he had poured that fiery spirit, with the powder of white hellebore-root; but neither did these acrid stimulants awake him, although the day following his nose was very much swelled and inflamed. It is certain, that no person in health can counterfeit sleep so, if these stimulants are applied, which would occasion violent convulsions unless all the senses were buried in such a profound sleep.

At the same time it appears from those observations, that in such a sleep, which in other respects exactly resembles the natural, and can only be called *morbid* from its being long continued, the most powerful remedies are of little or no service, sudden immersion in cold water only excepted.

Of CHRONICAL DISEASES.

§. 1050. **H**AVING thus gone through the principal *Acute* Diseases, both internal

ternal and external; we come now to treat of the *Chronical* ones. These, if produced within the body, arise either from the humours gradually vitiated, or from morbid remains of acute diseases which have not been well cured.

Celsus, as was said before in the comment to §. 565, has very well defined tedious diseases to be those *in which neither health nor death are near at hand*^a. Certainly those diseases are both very frequent, and usually very troublesome both to patients and physicians; while, upon account of the obstinacy of the cause, they often either cannot be eradicated at all, or not without the greatest difficulty. Celsus indeed will have it, “that a physician is more to be excused for being
“ of little service in acute disease, than in long ones.
“ For in the former the time is short, and the patient
“ dies unless he is speedily assisted; but in the latter
“ there is time both for deliberation, and for changing the remedies; so that the patient, if he is tractable, seldom dies, provided the physician is called
“ in time, and performs his office skilfully^b.” But there he supposes two conditions requisite to the successful cure of chronical diseases, *viz.* that the physician be called in the beginning of the disease, and the patient be tractable: but these diseases frequently steal on very gradually, and have fixed deep root, before the physician is applied to, seeing the functions of the body are usually hurt by slow degrees. Besides, patients are not always tractable, because they are not frightened by imminent danger, and the length of the cure itself frequently renders it irksome to them. Aretæus has judiciously remarked this; saying, “*Tedious diseases are attended with much uneasiness, the time of concoction is long, and the cure uncertain; for they are either not entirely cured, or return upon the slightest occasion: neither have the patients temper to bear them out to the end; or in*
“ case

^a Sub quibus neque sanitas in propinquo neque exitium est. *Lib. iii. cap. i. p. iiii.*

^b *Ibid. p. xix.*

“ case they have, yet they grow weary of being confined so long to a physical diet^c.” If we consider, at the same time, that, in acute diseases, the fever which attends them resolves the lentor and viscidty of the morbid matter, provided its force is restrained within proper bounds (see §. 609.) and at the same time disposes it to be discharged by critical evacuations; that the patients, frightened at the danger of the disease, and tamed with the violence of the symptoms, obey the orders of the physician punctually; that an acute disease, as Celsus^d himself confesses, the older it is, may be the easier cured, (for then the too great force which is common to acute diseases is usually abated); and, on the contrary, a chronical disease is rendered by delay harder to cure: if, I say, all these things are considered, it will appear, that it is more difficult to cure chronical than acute diseases. Certainly skilful physicians have greater hopes of curing a peripneumony, although it is a very dangerous and acute disease, than of curing a phthisis; and the frenzy is more frequently cured than madness. An inflammation of the liver is often enough cured, but a schirrhous obstruction of the same viscus is hardly ever got the better off. The same will likewise appear in examining the acute and chronical diseases of other parts of the body. Whence it is justly observed, “ That a long disease, when it is quite fixed, is as difficult to cure as an acute one^e;” nay, it is much more difficult to eradicate. It follows now, that we consider those general circumstances which are known concerning the origin of chronical diseases. But here we only treat of the causes which arising within the body occasion those diseases, For there are likewise other causes, not pre-existing in the body, which, applied to it, are very apt to produce the worst kind of chronical diseases. An injudicious compression of the head in new-born infants, or even in children when they are pretty well grown-up, has frequently given occasion to perpetual ideotism, and convulsions during life. Tying the
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^c In Proœmio lib. i. de Causis et Signis Morbor. Diuturn. p. 26.

^d In loco modo citato. ^e Ibidem.

the collar too tight has produced a frequent bleeding at the nose, and a lasting head-ach, as I myself have seen. The famous Winslow^f has observed a great deal of mischief occasioned by binding the belly too tight in the fair sex, by means of stiff stays. Dislocations of the vertebræ, occasioned by a fall, a violent contusion, or the like causes, have frequently produced incurable palsies, asthma's, &c. While quartan agues are epidemical, the healthiest persons are frequently taken with that disease, which continues for several months, without any complaint having before appeared in the body, or any error committed in the six non-naturals, to which the origin of that disease could be any ways attributed; as will be said afterwards in the chapter upon several Epidemical Diseases. But as we treated formerly of all these external causes, when speaking of Wounds, Contusions, Obstructions, &c. and we shall treat afterwards of Epidemical Diseases; we shall only speak here of those causes, which arising gradually in the body produce chronical diseases.

But there are two general sources of those causes: for either the humours contract bad qualities *slowly* and by degrees, (for *sudden* alterations of the fluids produce acute diseases, or very soon follow them after they have been produced by an epidemical contagion); or the humours remain variously vitiated, after acute diseases which have not been perfectly cured. Perhaps it may appear surprising that there is no mention here made of the solid parts of the body, seeing by faults of them chronical diseases may be produced. But it ought to be considered, that here we are speaking of tedious diseases, and that diseases of the solids can never remain long without being followed by morbid dispositions of the fluids. For diseases of the solids are either owing to too great laxity, or too great rigidity, or a solution of continuity. But too great laxity of the solids produces a spontaneous corruption of the fluids (see §. 26, to 54.), of which we shall treat in the following aphorism at n^o 3. Too great a rigidity of the solids, either suffocates all motion; or, by too strong a

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reaction of the vessels upon the contained liquids, the most fluid particles are expelled, whence the remaining parts are condensed, and thus a morbid disposition is communicated to the humours, of which we shall speak at n^o 2. of the following aphorism. But a solution of continuity of the solid parts produces an extravasation of the humours, and a spontaneous corruption of them after they are extravasated, Hence the reason appears, why the above general division of the causes of chronical diseases is sufficient. Concerning each of these we shall now treat separately.

§. 1051. **B**AD qualities of the humours gradually produced arise, I. From the ingesta; viz. air, meats, drinks, spices, medicines, poisons; so foreign, as not to resemble our humours; or so strong, as not to be assimilated to our fluids by the force of our viscera and humours. These are, 1. *An acid acrimony*, (60, to 69.) 2. *An austere acrimony*, composed of a sour and an earthy principle united, as is the case in unripe fruits, or astringent juices, wines, and the like; which coagulate the fluids, constrict the vessels, and hence occasion hard obstructions, (31, 36, 40, 50, 51, 113, n^o 1. 117.) This is cured by diluents, fixed alkaline medicines, and saponaceous alkalescents, long, and judiciously exhibited. 3. *An oily aromatic acrimony*, owing to meats, drinks, and spices, hot to the taste and smell: these produce heat, attrition, and erosion of the small vessels, burning pains, attenuation, putrefaction, and extravasation of the humours, and many such like effects. They are cured by watery, farinaceous, gelatinous, and acid remedies. 4. *An inert oil*, produced from too plentiful eating of fat substances, viz. of land-animals, fishes, and oily vegetables; hence an obstruction

(117), a bilious rancidity, inflammation, corrosion, and the worst kind of putrefaction, (82, 526.) It is cured by diluting, saponaceous, and acid medicines. 5. *Muriatic saltiness*, from sea-salt, or salted meats; which destroys the vessels, renders thin and acrid the fluids; hence it produces atrophy, bursting of the vessels, and extravasations of the humours, which do not quickly putrefy, but occasion spots. It is cured by water, acids, and a lixive of quick-lime. 6. *An alkali*, (76, to 91.) 7. *A glutinous quality*, (69, to 76.) II. From the force of the viscera acting too strongly upon the ingesta, (50, to 58. 92, to 106.) III. From spontaneous morbid changes of our humours (58, to 91.).

Health is confined to a certain latitude, (see §. 1.); and in this latitude it admits of small changes, which indeed recede from a perfect state of health, strictly so called, but in the mean time do not yet much disturb the functions. Whence Galen (see §. 1.) has said, “Health, whether real or reputed, is not absolute, “and indivisible; but we give this name to such a degree of it as renders a man capable of going about “his business.” Wherefore our humours may gradually recede from those conditions which they enjoy in perfect health; and nevertheless, while they begin thus to degenerate, they may not yet sensibly hurt the functions. But while this receding from the laws of health increases, or the quantity of the degenerating humours is augmented, then a manifest hurt of the functions appears, and is called a disease. Whence Hippocrates, treating of the diet of persons in health, says, *For although they decline very little from the rules of health, yet in time the body will necessarily be overcome by the excess, and fall into a disease*^a. A little afterwards

^a Nam etsi a cæteris non multum deficient, temporis tamen spatio corpus ab excessu superari, et in morbum incidere necesse est. *De Vitiis ratione Sanor. lib. i. cap. 2. Charter. Tom. VI. p. 449.*

wards he adds the following: *For diseases do not immediately happen; but being collected by degrees, discover themselves in complications*^b. Which seems chiefly to be meant of chronical diseases, arising from a vicious quality of the humours gradually contracted. We come now to consider the principal causes from which those vicious qualities in our fluids do gradually arise.

I. It is demonstrated in the physiology, that the aliments, by the conjunct actions of the viscera, vessels, and sound humours, are successively so changed in the body, as to be turned into our very solids and fluids themselves; and thus those parts are daily restored, which by the actions of health itself were destroyed. But, as was said before in the comment to §. 25. in order to produce this effect, it is requisite, that the aliments be of such a quality, as can be subdued by the changing powers of the body, and so put on our nature. But certain experiments teach us, that all the aliments are not with equal ease subdued by these powers just mentioned; nay, that some of them must circulate a long while with the humours through the vessels, before they can put off their native quality, and be perfectly assimilated to our fluids and solids. Persons who use garlic with their victuals daily, have a disagreeable smell of garlic all over their body; the flesh of a hare, which has been fed for some days upon cole-wort leaves, contracts a very disagreeable taste and smell. Maddar, mixed with the food of animals, not only dyed the inside of the stomach and intestines with its colour, but likewise tinged the most solid bones remarkably red; still retaining its native quality, even while it adheres united with the solid parts of the animal. But it was likewise observed, that these animals pined away, while they used the madder, which so absolutely resisted their assimilating powers^c. Here therefore is discovered a fruitful enough source of chronic diseases, from the sole disposition of the aliments above-mentioned, whereby they are so different

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^b Neque enim morbi derepente hominibus accidunt, sed paulatim collecti, confertim se produnt. *Ibid.*

^c Medical Essays, Vol. V. part ii. p. 930. Acad. Royale des Sciences, l'an 1739.

from our humours, and too much resist the changing powers of our body: and at the same time the reason appears, why weak persons are hurt and fall away upon too full a diet, which would easily be digested by strong labouring people; and why such foods as come nearest the nature of our humours in their qualities, before they are taken down, agree best with weak persons, as was explained in the comment to §. 28. Thence likewise is understood, why in strong labouring people, chronical diseases for the most part only arise from complaints remaining after acute diseases, which have not been perfectly cured: whereas, in weak and indolent persons, chronical complaints are produced from morbid qualities of the fluids, gradually arising from the aliments not being perfectly assimilated.

It appears by a great many experiments, concerning which see §. 647. that there is air mixed with our humours; but that it is so united with the other particles, that it is not elastic; and that the worst complaints may be produced, if it recovers its elasticity. But the famous Mr Hales^d has demonstrated, that a considerable part, both of animal and vegetable substances, is composed of such a fixed air, which is not elastic; and that this air remains so for several years in the solid parts both of vegetables and animals; and recovers its lost elasticity anew, when its coherence with the solids is destroyed by the fire. Therefore the powers which assimilate the aliments in animals have this efficacy, that they render the air not elastic, mix it intimately with the fluids, and unite it firmly with the solids. May not those troublesome flatulencies, which are so frequent in lingering diseases, perhaps be owing to the air taken in with our food not being sufficiently subdued and changed, from the assimilating powers being weakened? But there are innumerable particles fluctuating in the air, which, entering together with it into the body, are capable of disturbing health, (see §. 605, n^o 4.) Thus persons who live in low marshy situations, are usually very much afflicted with the scurvy: and other endemic diseases frequently arise from

^d Vegetable Statics passim.

from the like cause; on which we shall speak more at large in §. 1408, when treating of Epidemical Diseases.

But likewise a greater tenacity of the food than the assimilating powers are able to overcome, is a frequent cause of chronical diseases. While hard kinds of food, glutinous, farinaceous eatables, are given to young children, the belly swells and grows hard, and the rest of the body is wasted with a slow marasmus. From the same cause likewise persons confined in besieged cities pine away miserably, whilst from the scarcity of provisions they are obliged to use food which is hard to be digested, (see §. 25, n^o 1.) The same thing is likewise true with regard to drink, even water itself, if it is drank hastily, in too great a quantity, by a person who is very thirsty, and fatigued with violent labour or exercise, or parched up with a fever. For unless the digesting powers are so strong, as to be able to move that large quantity of water, and send it out of the body either by the skin or kidneys, the persons begin in a short time to swell, and fall into a dropsy, from this cause alone. Piso ^c saw a youth, who, by drinking water immoderately in a tertian fever, towards the decline of that disease fell into an ascites; and he remarks, that the same thing happened to a peasant, who in the time of harvest, when he was very hot with working, indulged himself in drinking water too plentifully. Hence the officers in time of war prudently place guards, to prevent the soldiers, who are fatigued with long marching, and very thirsty, from drinking too much water. But it has been observed, that standing water is much more hurtful in such a case than running water: and Hippocrates ^f has likewise remarked this, while he informs us, that an universal dropsy may be produced in such a case: *If a person in hot weather, being fatigued with travel-*
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ling,

^c Observ. et Confil. de Morbis a serosac. Fluxie, sect. iv. cap. 3. p. 333.

^f Quum quis per æstatis tempus ex longo viæ itinere in aquam pluviam et statariam incideret, eamque avidè copiosam biberit. Si igitur carnes aquam ebiberint et in se continuant, nusquam autem secessus fiat, hæc contingunt. *De Internis Affectibus*, cap. 28. *Quarter. Tom. 1. p. 338.*

ling, drinks plentifully of standing water; if his vessels drink up the water, and retain it, and it is not sent off by any of the excretions, these consequences will happen. It is very well known, that a chlorosis, and great weakness, the whites, and floodings from the uterus, happen to women from indulging in warm watery liquors. The more acrid spices, taken long, and in too great a quantity, have likewise this effect, seeing they gradually produce such an acrimony of the humours as to occasion obstinate chronical diseases; as appears in the muriatic scurvy affecting those who either are too fond of salt meats, or are forced to eat them from the scarcity of others; as is frequently the case in long voyages, especially if there is at the same time a scarcity of water.

But as medicines, according to Hippocrates (see §. 5.) are all such things as alter the present state, and change whatever is violent, they may occasion still a greater degeneracy of the liquids, and produce lingering diseases. I have seen this frequently in those persons, who, though they enjoy a good enough state of health, are always solicitous about preventing future diseases, and frequently extort remedies from the physicians against their will, or always attempt to change something in the body out of their own head, and, *in secunda valetudine adversæ præsidia consumunt*, “in health
“ waste the stores which ought to be preserved against
“ sickness &c.” Prudent physicians, by a pious fraud, prescribe to those persons such remedies as least disturb the body, crying them up at the same time for their wonderful efficacy. But if, not contented with these, they use repeated bleeding, purges, and vomits, they destroy their health, and fall into chronical diseases, very hard to be cured, even merely from their strength being impaired, *cum omnibus morbis obnoxia maxime infirmitas sit*, “since weak persons are most
“ obnoxious to all diseases,” as Celsus^b has very well observed, condemning the too frequent use of purging medicines. There is a remarkable epitaph in Italy,
of

^a Celsus, lib. i. cap. 1. p. 21.

^b Ibid. cap. iii. p. 31.

of one who suffered a premature death from this kind of imprudence :

Stava ben, ma per star meglio, stoqui.

“ This person killed himself by striving to mend a
“ good constitution.”

But poisons leave behind them still much worse diseases, and for the most part quite incurable. I mentioned before, in the comment to §. 586, no 1. a girl who lived diseased for three whole years after taking arsenic. Thus there are persons who know how to temper poisons, so as that those who take them linger a long while ; innumerable instances of which we read amongst historians. The fumes of quicksilver, put in motion by the fire, render those who get their livelihood by gilding metals very wretched ; seeing they remain affected with a paralytic trembling in all their limbs during life, and sometimes I have known them thereby rendered epileptic. The fumes of melted lead, or any kind of calx of it, taken into the body, frequently produces the colic of Poitiers, and afterwards the worst kind of palsy : for all these substances cannot be subdued by the animal-powers ; and occasion a slow, but often a certain death.

We come now to consider the principal classes of vitiated qualities in our humours, which, being gradually produced, are capable of bringing on chronical diseases.

1. An acid acrimony.] Concerning this acrimony, the causes from which it usually proceeds, and the diseases which it produces, we treated before in the numbers here quoted.

2. An austere acrimony.] It appeared, when speaking before, in the numbers here quoted, of strengthening the too great flaccidity of the solid parts of the body, that, the strength of the fibres being increased, the cavities of the vessels must thereby be straitened, and the liquids coagulated ; or, at least, that the mutual cohesion of the particles which compose our fluids must be increased ; whence they have so good an effect, when the humours are too much dissolved, and
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the vessels yield too easily to their impulse. But when these are either taken longer than is proper in the cure of the like diseases, or imprudently administered to a person in health, they produce the worst kind of obstructions, which can hardly be cured, because in this case two of the most powerful causes of obstructions concur, *viz.* a tightning of the vessels, and a close union of the particles which compose our humours (see §. 108.) When, in collyria, vitriol, alum, and the like, are imprudently applied to the eyes, the vessels of the tender and pellucid cornea are so corrugated, and the humours so coagulated, that the callous opake spots frequently remain upon it during life, and can by no means be removed. While the children of country people eat too plentifully of unripe fruit, they frequently are subject to a swelling in the belly, obstructions in the bowels, indurations of the glands, and a certain kind of scab. It is true, indeed, that those austere substances act first and most efficaciously upon the stomach and intestines, and by constricting the mouth of the absorbent veins seem to preclude their passage into the vessels so that they cannot easily infect the blood: but also from this effect alone great mischief may be produced, seeing the minute vessels of the internal coat of the stomach and intestines are so contracted, that the arteries cannot discharge, nor the veins absorb, the fluids as usual, and thereby the whole chylification must be disturbed. But when those austere substances are much diluted, either by drink, or by the fluids which are conveyed to the intestines, they then enter the lacteal vessels, and occasion the worst kind of obstructions in the glands of the mesentery; or they are likewise carried off from the mesenteric veins by the vena portarum to the liver, and there produce the like bad effects: hence chronical diseases of the abdominal viscera usually arise from this cause. Daily observations teach us, that the greatest mischiefs happen from the use of austere wine made of grapes not sufficiently ripe; hence perhaps often happen those *contractions*, as they are called, so frequent in Austria, when the ligaments connecting the bones become rigid. Ferment-

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ed spirits have also the like effect of coagulating the liquids and contracting the solids; persons who use them too freely commonly die of chronical diseases, with a schirrhous induration in almost all the viscera, as was said before in the comment to §. 28, n^o 4.

Diluent^s are here of service, both as they weaken every kind of acrimony by the simple interposition of water, and as at the same time they remove too great a rigidity of the solids (see §. 35). But water alone is hardly capable of dissolving the coagulation of the fluids produced from austere substances; hence are added fixed alkalis, which resolve and attenuate concretions from an acid. But as here likewise an alkaline acrimony is to be feared (see §. 86); hence they must be drunk cautiously, a small quantity at a time, and diluted with plenty of water, and the smallness of the dose ought to be compensated by repeating it frequently. There is such a moderate quantity as this of alkaline salt in some medicinal waters; whence they are of great use in diseases of this kind; such as Selter's, Anthony's, Wildum, and Buchen's waters; and in different countries there are others of a like nature, which are used very successfully in a great many chronical diseases.

Soap likewise, prepared from a fixed alkali, intimately mixed with any pure expressed oil, affords both a safe and effectual remedy against those complaints, seeing it retains the dissolving power of the alkaline salt, subdues every thing that is acid, and at the same time, on account of the oil, does not hurt by its acrimony. For that the human body can bear a great quantity of this soap without being hurt by it, appears from the use of the English lithontriptic; of which we shall speak afterwards in the chapter upon the *Stone*. The use of soap is of great service to young persons who suffer from an acid, and have the intestines obstructed with coagulated milk; while alkaline salts, especially if they should be used in a large quantity, would destroy their tender viscera.

3. An acrid aromatic oil.] Aromatics are known by their hot taste and fragrant smell; and although the

intenseness of the aromatic acrimony is various in different aromatics, nevertheless they are all more or less acrid. But it is observed, that that taste and smell of theirs are inviscated in an oil, upon being freed from which they soon dissipate into air; hence they are called *oily aromatics*. Thus the whole fragrantcy of cinnamon is contained in its distilled oil: and not only the same thing is observed in mace and nutmegs; but likewise, if they are bruised, and squeezed in a press, they ooze out a great quantity of oil, which has the consistence of hard butter, and is every where in the shops. In the root of master-wort when it is cut, you may discover little bladders, even with the naked eye, which are full of an aromatic oil of this kind: and the same is the case in several of the aromatic seeds. For this reason a stimulus, communicated to the body by aromatics, adheres more obstinately by its oily tenacity, and is much more heating. It is well known, that all these are mixed with the food, and used at the tables of wealthy persons, under the title of *spices*, to provoke an appetite after they have eat sufficiently. From the same are likewise prepared aromatic spirits and tinctures, which being sweetened with sugar they present with the desert; viz. that the stomach loaded with too much food, may sooner and better disburden itself. These things are easier borne by such persons as drink only water to their meals: but those also who indulge with generous wines do not abstain from these, believing them to be very useful for helping digestion; nay, almost quite necessary after plentiful feasting. Thus they add fuel to fire, and by the imprudent use of them the most violent burning fevers are frequently produced; as was said before in the comment to §. 586, no 1. But from the increased motion of the humours by those aromatic stimulants (see §. 99.) a greater heat being raised in the body, and at the same time an acrimony produced in the humours, pains often arise with a sense of heat in the stomach, and frequently they are followed with very troublesome head-achs; and the vessels burst; whence plentiful bleeding at the nose, spitting of blood,

blood, a discharge of the same by the hæmorrhoids with great pain, and apoplexies which are either suddenly mortal or else terminate in a tedious palsy. But that a great many very obstinate, even chronical, complaints, may be produced from the humours extravasated, or rendered putrid by too great heat (see §. 84, n^o 5.) appeared from what was said in the comments to §. 85, 86, 100. And it will appear afterwards in the comment to §. 1491, that a very painful and tedious disease, *viz.* the Rheumatism, commonly happens to those who are of a sanguine constitution, and at the same time whose humours are acrid. The immoderate use of garlic, onions, pepper, mustard, horse-radish, and the like, in sauces, has sometimes been thought to occasion this disease, and not without reason.

But the method of cure requisite for correcting this acrimony, was explained in the comment to §. 605, n^o 8.

4. An inert oil.] It appears from daily experience, that by plentiful food, and ease, animals grow fat; and indeed to such a degree, that at last they are as it were choked and buried in their own grease. But what complaints may arise solely from the accumulation of fat compressing the neighbouring vessels and viscera, was explained in the comment to §. 1010, No I. At the same time it was observed, that that fat oil might lie so concealed in several vegetables, that no body could easily believe that there was such plenty of it; which oil is extricated from these vegetables by chylifications, and may occasion great corpulence. If therefore such aliments are taken in which that rich oil abounds, then the corpulence will be increased. But this fat in a healthy person is quite mild, and only troublesome from its bulk; especially if it is not dispersed all over the body, but accumulated only in certain places. A case of this kind the celebrated Boerhaave saw (see §. 75.), where a fat tumour, weighing six pounds, gradually growing in the cavity of the thorax, killed a nobleman after unsufferable torments. But when that fat, by means of a fever, is dissolved, attenuated, and mixed with the blood, then it acquires
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the worst kind of rancid acrimony, and produces a very dangerous plenitude of the vessels, as was explained at large in the comment to §. 693; and at the same time it occasions a sudden putrefaction. In the same place we mentioned, what remedies are requisite in a case of this kind. These effects are produced, when the fat, being suddenly dissolved, is mixed with the circulating humours. But it may likewise be hurtful by compressing the neighbouring vessels and viscera, from its bulk only; and then it is proper to diminish that too great quantity of fat: which may be effected by doing every thing contrary to those causes which are observed to accumulate fat in sound persons; which causes Celsus has collected, saying: *But the body is rendered fat by moderate exercise; frequent rest; anointing, and bathing after dinner; costiveness; moderate cold in winter; sufficient sleep, and not too long protracted; a soft bed; an easy mind; such aliments as are chiefly sweet and fat; frequent eating, and as much as a person can digest*^h. A little after he recommends the contrary for extenuating the body. The best method is, gradually to evacuate that which is superfluous; and at the same time to strengthen the parts which were over-distended by too great repletion, and now rendered flaccid by the vessels being emptied. Bodily exercise is of very great service in answering both these purposes; for it both melts down the fat, and at the same time increases the strength of the solids, (see §. 28, n^o 2.) Hence we see that horses are made lean by working, although they are nourished with plenty of very good food: so likewise men who get a livelihood by constant hard labour, never grow fat. But in the mean time prudence is requisite in this affair: for it is certain, that fat persons cannot without danger undergo violent bodily exercise: for the fat being melted down by the heat of the body, which is increased by exercise, may occasion a dangerous

^h Implet autem corpus modica exercitatio, frequentior quies, unctio, et, si post prandium est, balneum, contracta alvus, modicum frigus hieme, somnus plenus et non multum nimis longus, molle cubile, animi securitas, assumpta per cibos et potiones maxime dulcia et pingua, frequentior cibus, et quantum plenissime potest digerere. *Lib. i. cap. 3. p. 28.*

ous fulness of the vessels, and by its immeability obstruct the small vessels in the brain and lungs; whence sudden death has frequently followed, which grooms often likewise observe in fat horses that have been suddenly hard run after standing for a long time at ease in the stable.

Hence the properest method is, first, by gentle purges, frequently repeated, to diminish the quantity of fat with which these bodies are burdened; and afterwards to use exercise, increasing it by degrees; for thus the too great corpulence will be gradually and safely diminished. For while hard labouring people exercise their bodies violently, their urine is of a reddish colour, and their clothes are stained with a greasy sweat: But it is demonstrated from chemistry, that the redness of the urine principally depends upon the oil which is mixed with it; and therefore it appears, that by the motion of the body that fat may be expelled. Whence Galen ^k has recommended purging, moderate friction, foods which satisfy the appetite but afford only sparing nourishment; as the chief remedies for diminishing the too great quantity of fat. Hence likewise we understand, why Hippocrates ^l has advised fat persons, who are desirous of becoming lean, to use fat meats, *viz.* that they may be satisfied with a small quantity. For in another place he recommends a spare diet: *In whatever diseases dryness is of service, it is proper to eat only once a-day, and to take a smaller quantity both of meat and drink than fills the stomach; as also to fatigue themselves with labour and walking, and to sleep but little* ^m. It is observed ⁿ, that anxious cares, and watching, occasion leanness: but these are apt to produce other complaints; hence it is better to use the former.

Besides, we observe some men who continue al-
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^k De Sanitate Tuenda, lib. vi. cap. viii. Charter. Tom. VI. p. 175.

^l De Salubri Victus Ratione, ibid. p. 227.

^m Quibuscumque morbis siccitas conducit, semel in die cibum capere confert; et cibus et potus pauciores, quam ut repleantur, infumere; eoque laboribus et deambulatione conficere, et quam minimum dormire. De Affectionibus, cap. 12. Charter. Tom. VII. p. 632.

ⁿ Celsus, lib. i. cap. 3. p. 28.

ways meagre, although they eat very heartily. In those the urine is acrid, subfetid, and of a yellow-greenish cast; the colour likewise of the whole body appears yellowish: but these are symptoms of what is called a bilious constitution, in which the bile is both plentiful and acrid. Whence it is of service to fat persons, if, together with what has been above recommended, they take the following bitters, *viz.* wormwood, lesser centaury, gentian root, and the like, which are only of use in those diseases where the bile is either too inert or deficient in quantity. Galen has likewise remarked this, in treating of the cure of fatness: *A hot and dry constitution renders the body slender: wherefore a corpulent person ought to make to himself such a constitution, if he chuses to be lean.* For this purpose he recommends the like remedies as the above: *Rutæ Sylvestris corymbos et semina, Aristolochiam rotundam, Centaurium minus, Gentianam, &c.* “ the
“ tops and seeds of wild rue, round birthwort, the
“ lesser centaury, gentian, &c.” He observed so much efficacy in those remedies, that he mentions some, who, after they were become slender, or of a moderate habit, killed themselves by using them imprudently for curing diseases of the joints; for which purpose the like remedies are usually recommended, as will be said afterwards in the chapter upon the Gout.

But although evacuations always seem of service in those full habits; yet we see that bleeding was not commended by the ancients for diminishing fatness. It was observed before in the comment to §. 1010, No I. that the blood-vessels were found to be less capacious in fat persons; whence they do not always abound with blood. Bleeding indeed is sometimes required to prevent those mischiefs which usually follow or attend too great corpulence; as likewise, when that fat, dissolved by the heat of the body, sudden exercise, or a fever, enters the veins anew, and occasions

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o Calidior sicciorque temperies exile corpus reddit: ergo talis tibi facienda est crassi corporis temperies, si ad symmetriam reditutum sit. *Metb. Med. lib. xiv. cap. 15. Charter. Tom. X. p. 335.*

a very dangerous plenitude of the vessels. But repeated bleedings rather dispose the body to grow fat; as was said before in the comment to §. 106, n^o 3.

5. A muriatic saltnefs.] It was said a little before, under this same aphorism, that sea-salt, whether taken in sauces, or added with flesh, fish, or pot-herbs, in order to preserve them, may be mixed with our humours, and tenaciously adhere to them. But while our fluids, rendered acrid by the sea-salt which is mixed with them, are moved through the small vessels, these are easily eroded, and hence extravasations are produced. However, as this salt resists all putrefaction, hence these *extravasated fluids* do not easily corrupt, but produce blue spots under the skin, which remains whole; as will afterwards be said in the chapter upon the Scurvy. But as a mild disposition of the humours is requisite ^P for restoring those parts of the body which are dailywasted by the actions of health itself; hence, when our humours abound with a muriatic acrimony, an atrophy is produced. See likewise what was recommended for correcting this acrimony in the comment to 605, n^o 7.

6. An alkali.] Of this acrimony we treated before at the numbers here quoted.

7. A glutinous quality.] Of this indisposition of the fluids we likewise treated before.

II. The aliments are so changed by the assimilating powers of our body, that, laying aside their natural dispositions, they put on qualities resembling those of our *fluids* and *solids*. But physiology teaches us, that that change is brought about, while a small part of the aliments is mixed with a great quantity of our liquids, and then moved with them a long time thro' the vessels and viscera. But the action of our vessels, upon the contained liquids, depends upon that contraction whereby they press and condense the humours. For chyle and milk, which are prepared from the aliments, have a smaller degree of density than the blood and serum. If therefore the vessels, being too strong, condense the contained humours too much, then both

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the more fluid parts will be expelled, and what remains will be less fit to pass through the small vessels; and therefore will be rendered apt to stick in the extremities of those vessels, and produce obstinate obstructions, while at the same time the rigid vessels resist the dilating force. But what complaints may thence be produced, was explained in the comment to §. 52, *et seq.* It is sufficient here to observe, that the origin of a polypous concretion in the blood, may justly be attributed to this cause. and how chronical and obstinate this complaint is, every body knows.

But if, the natural strength of the vessels remaining, by the increased velocity of the circulation, within a given time, their action upon the contained fluids is more frequently and strongly applied; those likewise will degenerate from the qualities requisite to preserve health: whence various complaints, both acute and chronical, will be produced; of which see what has been said in the comment to §. 100.

But when a very strong force of the vessels, and an increased velocity of the circulation, concur together; then there will be sudden and violent changes of the humours, as happens in acute diseases: which likewise gives origin to chronical complaints, as will appear in the following aphorism.

III. Those changes of our humours are called *spontaneous*, which are produced by common causes, acting upon all bodies, without any regard had to the vessels in which they are contained; or to the vital motion, by which they are continually agitated, being either too violent or too torpid; as was said before in the comment to §. 57: whence those changes are chiefly produced from our humours stagnating in different parts of the body. Concerning a spontaneous degenerating of the humours into acrid, acid, alkaline, and likewise into a glutinous lentor, we treated before in the numbers quoted in the text. But there are likewise other spontaneous changes in our humours, occasioning the most obstinate chronical diseases; which it may be worth while to explain by a few examples. Sound blood taken from a vein, although it be kept in

a heat equal to that of the body of a person in health, spontaneously separates into two parts, *viz.* a fluid serum, and a red concreted mass. If therefore a person, who has fallen into a true syncope, should remain in it for some minutes without any motion of the heart, the blood will stagnate in its ventricles, sinuses, and auricles, and the serum will begin to separate from the red part; whence polypi will afterwards remain, never to be quite dissolved, and very much disturbing the actions of the vital viscera. If the passage of the bile from the gall-bladder into the duodenum should from any cause be hindered, that liquid, while stagnating, having its thinner part resolved, what remains will be inspissated, and form stony concretions, which often produce an obstinate and chronical jaundice. The urine of a person in health, received in a clean vessel, spontaneously deposits a calculous crust; but if it is retained in the body it does the same thing, and produces very painful diseases, as is too well known. That unctuous matter, which, being collected in the cutaneous glands, oozes out by their orifices upon the surface of the skin, and anoints it, if it stagnates in any of these glands, it is gradually thickened, and produces large steatomatous tumours, by that spontaneous alteration. But tumours of the same kind have likewise been found in the internal parts of the body, as was said before. From these however it appears, in investigating the causes of diseases, what causes produce chronical distempers, and that we ought always to have an eye upon the spontaneous changes of our humours.

§. 1052. **F**ROM acute diseases badly cured, there arise morbid qualities in the humours in every part of the body. 1. Purulent (§. 158, n^o 5, 6, 7. §. 402.), producing a great many complaints (§. 936, n^o 4. §. 941.): Which are cured (§. 942.) 2. Ichorous (§. 158, n^o 4. §. 206.), the effect of which is to corrode, and consume: They are cured by mild, softening, in-

spiffating medicines. 3. Putrid, which are enumerated at §. 1051. N^o I. 3, 6. N^o III.

Acute diseases, as hath been frequently observed before, terminate either in death, health, or some other disease; in which last case they are said to be not well cured, although it is frequently impossible for the most skilful physicians to prevent an acute disease from terminating in another disease. For it is not always in the power of the physician to expel the morbid matter, which is dissolved and rendered moveable, out of the body; but frequently enough, being deposited by metastasis in other parts, it there produces new diseases. Nay, it is the part of a skilful physician, to assist these attempts of nature, when the symptoms discover that the metastasis is about to happen in parts of the body which are less dangerous; as was explained more at large in the history of Acute Diseases. But the principal faults of the humours which are observed while acute diseases terminate in others, are the following.

1. Purulent.] It will not appear surprising to any physical person, that acute and inflammatory diseases should produce abscesses in the parts which they affect, seeing suppuration is the event of a violent inflammation; though not of the worst kind, which terminates in a mortification or a gangrene, But it is likewise observed sometimes, in acute diseases, as we remarked elsewhere in the comment to §. 593, that a quantity of true pus may be suddenly collected in certain places of the body, although no sign of a topical inflammation or suppuration has appeared in any particular part. Whence it appears probable, that then the morbid matter has indeed been concocted and rendered moveable, but at the same time is vitiated, so as to acquire the like properties with pus, although it circulates with the rest of the humours through the vessels, whence the pus already formed is deposited in various parts, but is not generated in those parts in which it is afterwards found. This we confirmed by practical observations, and by the testimonies of Hippocrates

pocrates and Galen. But of those symptoms which appear when the pus is formed, we treated before in the History of Wounds at §. 158, n^o 5, 6, 7. as also at §. 387. But what mischiefs are produced, if pus, collected upon any part of the body, is resorbed by the veins, and mixed with the blood, was said before in the comment to §. 406; as likewise in that to §. 936, n^o 4. and to §. 941, where we treated of an Abscess of the Liver. At the same time, in the comment to §. 942, it appeared that it is very difficult to correct such a purulent cacochymia; and there we likewise mentioned the remedies which are most likely to be of service in such a case.

2. Ichorous.] Good, smooth, unmixed pus, is void of smell and acrimony: but, in order to produce such, a mild disposition of the humours is requisite, (see §. 387). When therefore, in acute diseases, the humours are rendered acrid, in this case mild pus is not formed, but a thin ichor much more acrimonious and hurtful. Of this we have a manifest example in the small-pox: for when they are of a good kind, and the patient is of a healthy constitution, they are filled with laudable, white, thick pus, but when they are of the confluent sort, instead of pus; they contain an ichor much more acrid, which frequently preys upon the skin, and occasions very ugly scars. Besides, good pus, too long shut up in an abscess, by heat and stagnating is rendered thinner, and at the same time more acrid, as was said in the comment to §. 406; and, being resorbed by the veins, infects the whole blood with a putrid cacochymia; or, deposited in some particular places, produces complaints very difficult to be cured. But that diluted, reddish, thin liquor (see §. 158. n^o 4.) which is observed in a recent wound, when the contracted vessels leave off bleeding, is sometimes also called *ichor*; though perhaps not so properly: for that liquor is soon converted into pus, neither has it any morbid acrimony; whereas ichor, properly so called, never changes into pus, but always becomes more acrid by stagnation.

The same remedy is required as in purulent diseases,
viz.

viz. such as, at the same time that it strengthens the body, resists all putrefaction: but as here there is greater acrimony, and the humours are more dissolved, mitigants and gentle inspissants are useful in this case. Prescriptions of this kind may be found in the *Materia Medica* to §. 198. no 2, 3; especially if the roots or leaves of wood-forrel are added to those decoctions, which resist putrefaction, and at the same time by their gentle astringent force correct the too great thinness of the humours.

3. Putrid.] It has been frequently observed before, that the humours in acute diseases may be rendered putrid; and it is explained in the comments to §. 933, 939, 945, 950. that this was chiefly to be feared in the Hepatitis. But the method of cure proper to be used in such a case, we treated of at the numbers quoted in the text.

§. 1053. **A**CUTE diseases ill cured in the solids or compound parts, leave abscesses (387, 402), fistulæ (413), empyema's (894), schirrhuses (392, 484, 485, 486), cancers (492, 494), caries (526).

Acute diseases, when they are either attended with an inflammation of a particular part of the body, or in their course are very much inclined to promote it, unless they can be cured by resolution, leave behind them all the consequences of an inflammation not resolved which are mentioned in this aphorism, and concerning each of which we treated at the numbers here quoted. Besides, in the history of the particular acute diseases, we mentioned the various ways by which they usually terminate in other diseases, all which may be referred hither.

Thus it appears, how from acute diseases, not well cured, may arise chronical ones, both on account of the fluids and solids of our bodies.

§. 1054. **F**ROM these, in simple diseases (1051, 1052,

1052, 1053), or diseases every way compounded with one another, an infinite number of others may follow, as effects; which therefore may be best understood and cured from the nature of those others, already explained.

If now those faults of the humours, gradually produced, or left after acute diseases which have not been well cured, are conceived to remain in different parts of the body, they will always disturb the function of the part which they occupy; and frequently likewise of the neighbouring parts, while either by their bulk they compress, or by their acrimony irritate or corrode them, &c. and therefore from such causes a very plentiful crop of diseases may spring up. If, for example, a pleurisy of the side should terminate in supuration; an abscess being there formed, by swelling inwardly will compress the lungs, and obstruct the respiration. Sometimes likewise a purulent tumour of the same kind grows to the neighbouring diaphragm, and the pus eating through it falls into the abdomen; whereby the oppression of the breast, which was felt before, is relieved for the present, but the event is very fatal: for there follows a purulent ascites, and a consumption of the viscera, which are steeped as it were in that pus daily rendered more acrid; from the putrefaction arises a tympanites; and at last, after the most exquisite tortures, follows inevitable death. But before the patient dies, how many of the functions are hurt! and what surprising symptoms frequently occur! Several practical cases of this kind, shewing what numerous chronical complaints sometimes follow upon inflammatory diseases of the viscera, are mentioned in the comment to §. 958. as likewise here and there in the History of Acute Diseases before given. If any one does but apply these to particular parts of the body, he will not be surprised, that chronical diseases, although they are very numerous, may be reduced to those classes of causes which are above-mentioned.

§. 1055. **S**EEING therefore all chronical diseases, as will appear, thence depend; therefore the general doctrine, and division, of them, are to be taken from that source.

It must be of great service in the practice of physic, towards determining the indication and method of cure, if, by disposing the causes of diseases into certain classes, the physician's memory is assisted so as to investigate them in order. For if any one attentively considers those causes, he will discover, even in the most intricate chronical diseases, what is to be done to remove, or at least to mitigate them: for there are a great many chronical distempers quite incurable, as will appear afterwards; and then physic can be of no service, except to render them more tolerable to the patient. But although a great many chronical diseases arise from acute ones not well cured, yet a great many more are owing to a bad use of the six non-naturals. Hence Sydenham has not scrupled to say, "Acute diseases for the most part have God for their author, as chronical ones are owing to ourselves^a." For in acute diseases persons, otherwise very healthy, fall into imminent danger of dying, frequently from a latent cause, at least from one which is not known but by its effects in the human body. This is evidently observed in the small-pox, the plague, and a great many other epidemical diseases; the cause of which seems to reside in the circumambient air, as will afterwards be explained more at large in the chapter upon Epidemic Diseases. Indeed it is very true, that air which is unwholesome, or subject to sudden changes of heat and cold, is not without reason believed in some places to produce chronical endemic diseases; but in the mean while, "they do not owe their origin so immediately to the air, but for the most part to that common parent of all these diseases, *viz.* an indigestion of the humours^b." But he chiefly blames great errors in the six non-naturals; especially in eating

^a In Dissertat. Epist. ad Gulielm. Cole, p. 458.
tatu de Podagra, p. 572.

^b Idem in Trac-

ing and drinking. Thus opulent persons who accustom themselves to eat and drink too heartily, when they begin to grow old especially, are more frequently subject to chronical diseases, than those whose narrow circumstances oblige them to be temperate even against their will. Hence Sydenham^c likewise remarks, that they are deceived, who imagine that in chronical diseases the whole cure can be performed by medicines alone: for unless the patient is temperate in eating and drinking, medicines for the most part will be used in vain. That great man did not propose to torment those patients by starving them, for thus their strength would be impaired; but he only allowed them as much as their stomach would easily digest. Nay, he likewise indulged their appetite in things that were not of easy digestion, provided they were contented with one kind of food, and did not tempt their palate with various cookery so as to make them exceed the bounds of satiety. Physicians frequently err in being too anxious in ordering too delicate food for their patients who labour under tedious diseases. Hippocrates^d certainly very judiciously observed, that errors committed by too meagre a diet are much more dangerous, than if a person exceeds a little in eating plentifully; and has absolutely condemned a sparing delicate diet in long diseases^e. It is sufficient, therefore, if they are content with simple food, and avoid those things which, being hard to digest, can only be borne by healthy, strong, and laborious persons; such as all salt eatables dried in the air or smoke, as likewise all kinds of fat food. Hunger determines best what quantity they ought to eat; and also their not finding themselves oppressed after eating. At the same time it is proper, rather to allow them to eat frequently, than a great quantity at a time. Patients readily obey such rules of diet, and more cheerfully submit to what else may be requisite towards the cure of these long diseases. On the contrary, if the physicians are too severe, the patients eat by stealth what they are prohibited to

^c Ibid. p. 578.

^d Aphor. 5. sect. i. Charter. Tom. IX. p. 11.

^e Aphor. 4. ibid. p. 9.

to have openly; and finding little or no harm from it, becoming bolder they indulge their taste in every thing, and despise the advice of their physicians. At the same time it must always be observed, that such foods are to be made choice of, whose spontaneous quality is opposite to the predominant fault of the humours; upon which subject we treated §. 58, to 92.

§. 1056. **W**HENCE likewise it immediately appears, that those diseases, tho' they are infinite with regard to the variety of symptoms, yet they do not depend upon so compounded an origin, nor require such variety of medicines or methods of cure: at the same time is discovered the reason of the tediousness in most, and the impossibility in curing many, of them; as will appear in treating that subject.

From what has been hitherto said it evidently appears, that from the innumerable variety of symptoms, chronical diseases ought to be observed, according to the variety of the morbid matter, the places which they occupy, the functions which they hurt, and the peculiar constitution of the patient. But the most wonderful symptoms of all use to arise in diseases, when the common sensory, and the nerves depending upon it, are affected by a morbid cause; as will appear afterwards, when we come to treat of the Epilepsy, Melancholy, and Madness. In the mean while it is plain, from the general causes of those chronical diseases which we have already treated of, that their origin is not so very various as at first sight might be imagined.

From the same circumstances it may be concluded, that the method of cure must likewise be not very different. I have known several persons surpris'd, upon examining the consultations of physicians famous in former days, that they frequently used the same remedies, or at least of the same kind, in curing diseases very different as to the symptoms. A great many, for
this

this reason only, have conceived a bad opinion of some of the most eminent physicians, who have deserved the greatest acknowledgements from mankind on account of their long and successful practice; nay, a great many patients likewise have taken it amiss, that they have been obliged to use the same remedies, and often very simple ones, for a long time together: especially the proud and rich; who so frequently deserve to be disappointed, seeing they look upon themselves as being treated the best, if the obsequious physician runs through the whole *Materia Medica* with them, changing their medicines daily, heaping one composition upon another, and using all the dearest remedies, which are of great service to the apothecaries, but of very little to the patients, exhausting the purse much sooner and more certainly than they cure the disease. I would advise such as despise the simplicity of physic in a great many chronical diseases, to consider how many and how different distempers are cured by the use of the hot baths and medicinal waters, which have been approved for so many ages. How often are patients obliged to have recourse to these, after trying the most celebrated medicines without any relief? It was demonstrated before in the comment to §. 107, that an obstruction is occasioned by the too great bulk of the fluid that is to pass thro' the capacity of the vessel that is to transmit it. But, in the hot baths, the water by its native heat relaxes and softens all the parts, insinuates itself into the bibulous cutaneous veins, is mixed with the blood, and washes the obstructed parts; and if these wholesome waters are drank at the same time, they afford a safe and powerful remedy for attenuating and dissolving the concretions in the obstructed vessels (see §. 132, 134.) But there is observed in all those medicated waters, a certain spirituous principle, very volatile, which renders them easily moveable through all the vessels of the body, and makes them that they can be drank in much greater quantity than even the purest common water. In some medicinal waters, that volatile principle is so very subtil, that they ought to be drank at

the fountain-head, nor can they be carried to any moderate distance without losing their strength: in others, it coheres more with the other parts of the waters; and these, being put up in bottles well-corked, may be preserved a long time, and carried to a great distance, as is very well known. But as soon as they are deprived of their volatile principle, they taste perfectly vapid; let fall a sediment; and, if they are drank in great quantity, they load the stomach, remain long in the body, and no more produce their remarkable physical effects. Some of these waters contain nothing else besides that volatile principle and pure water, at least nothing else can be obtained from them by any chemical experiments. But in others, again, there are found different substances, *viz.* an alkaline salt; a neutral one, very much akin to sea-salt; a purging bitter salt; sulphur; and iron dissolved in that spirituous volatile principle, and dissipated with it into air if these waters are carelessly kept: in some, fixed vitriol of iron has been observed, &c. Hence a judicious physician can chuse which waters he thinks most proper, according to the different cacochymia in chronical diseases, and the variety of the obstacle which loads the viscera and is to be removed. If a simple diluting of the humours, or the washing away of a muriatic acrimony of the blood, is required, the *Teplicza waters* will be sufficient for this indication. If an acid or austere acrimony predominates in the body, those waters will be of service which are impregnated with a considerable quantity of a mild alkaline salt, as for example *Selters waters*, which mixed with milk are commonly so beneficial in a purulent cacochymia. If an atrabiliary recement loads the abdominal viscera, the *Caroline waters*, and others of the same nature, are of very great use both for dissolving it and carrying it off. If strength is to be restored to languid weak bodies, and the action of the solids upon the fluids increased, the *Spaw waters* are drank with great success, as they communicate the soul as it were of the iron to the body, and by renewing the good blood so agreeably remove that drooping languor. Now, if at the same time

time we consider, that a great number of chronical diseases have their seat in the abdominal viscera, and especially in the liver, into which all the venous blood of the chylopoietic organs is poured, the reason will appear, why the use of medicated waters are so effectual in the cure of chronical diseases: for these waters, being drank in great quantities, and suddenly absorbed by the bibulous veins of the intestines, carry their whole strength with them in a great measure to the vena portarum; and so, being distributed to all parts of the liver, they dissolve the concreted fluids, and open the obstructed vessels.

These observations may suffice in general concerning the effects of medicinal waters: for to treat of them singly would be too tedious a task, neither does it belong properly to this place: especially as the famous Hoffman ^a has written so well upon them; and Anthony Cocchi ^b, well known both for his learning, and knowledge in physic, has likewise so lately treated of them, upon occasion of the baths of Pisa being restored by the generosity of the emperor, and rendered commodious with every thing relating to their usefulness and the accommodation of patients who resort thither. In this excellent treatise, besides other things well worthy of being read, there are cases of patients who have used those baths, related with undoubted veracity, which afford no small instruction to the attentive reader.

Besides medicinal waters, we see some of the greatest physicians in the cure of chronical diseases place great hopes in the fresh juices of herbs, if they are drank plentifully, and for a long time together, in the spring; likewise in whey, garden-fruits, Venice soap, honey, &c. of which we shall treat afterwards in the cure of Melancholy. The dissolvent force of all these is sufficiently powerful, and they act without increasing the motion or raising disturbances in the body.

Farther, in the cure of an obstruction (§. 132, 133.) the reciprocal motion of the vessels was cried up as most serviceable for resolving the concreted masses, which

^a Opusc. Physic. Medic. Tom. II. ^b Deori Bagni di Pisa in Firenze 1750.

sticking in the extremities of the vessels occasion obstructions; and on this principle frictions especially were commended, that by the alternate compressions and relaxations of the vessels, together with the use of the remedies above mentioned, the obstructions might be opened, the obstructed matter being dissolved and rendered moveable. The great use of frictions in curing many diseases, was mentioned upon another occasion in the comment to §. 28, no 2.; and we have seen, that the ancient physicians have every where recommended them in chronical diseases, and with very great justice.

Hither likewise are referred those concussions, which are occasioned by riding on horse-back, or in a vehicle. For all the viscera, and especially those of the abdomen, which hang pendulous in the cavity of the peritonæum, are agitated; and thus complaints are frequently cured, which otherwise appeared hardly possible to be removed, as was likewise observed in the comment to §. 28. Hence the reason is understood, why sick persons, who, during the time of using medicinal waters at the fountain-head, find themselves indeed relieved, but not yet entirely cured, when they attempt to return home, in the journey they frequently find the remains of the disease daily going off; and by the time they get to the end of their journey, their health is quite restored. For these concussions of the whole body, so frequently repeated, especially in a long journey, finish that which was begun to be dissolved and rendered moveable by the use of the medicinal waters.

At the same time, from what has been said, the reason of the tediousness of these diseases appears. For these causes, which are derived from morbid qualities of the humours gradually produced, creep upon the patient by degrees, frequently increase very slowly, and for the most part cannot be removed but by a long protracted cure. Whence Sydenham^c has very judiciously observed, that, in curing chronical diseases, “no wise person will imagine, that any slight or mo-
“men-

^c De Podagra, p. 576.

“mentaneous alteration, produced in the blood and humours by any kind of remedy or diet, can be sufficient for a cure; but the habit of body is to be entirely altered, and the whole man as it were quite renewed.” While a young girl, for example, labours under the chlorosis or green-sickness, what a small quantity of good blood has she in her body! how flaccid and inactive are all her solids! In such a case, no one can expect, that the entire mass of blood can be rendered good in a few days, and the whole solids of the body strengthened. Sometimes several months are required, before, by the strength being gradually increased, a firm state of health can be restored. Hence we see the reason, why physicians, in curing chronical diseases, frequently alter the whole method of living, that thereby they may communicate to the body a new habit. Hippocrates has said, *In tedious diseases, travelling abroad is of service*^d. Thus both the diet and air is changed, when at the same time, being freed from the cares of business, they are delighted with a continual variety of objects, which offer themselves to travellers; which alone is of great use in curing melancholic diseases, as will be said afterwards. Again, those complaints which follow acute distempers that have not been well cured, do in like manner usually prey upon the body very slowly; and a long time is required, provided the case is curable, before the blood, infected with a purulent or ichorous cacochymia, can be depurated, and the ulcerated viscera cleansed and consolidated, as is sufficiently evident. But those complaints are much more tedious which derive their origin from schirruses remaining after inflammatory diseases.

Hence likewise we understand, why we should long insist upon the same indication of cure, and not change the remedies daily in treating chronical diseases, although the patient finds no observable relief from them at first. Celsus has prudently advised this; saying, *In acute diseases, whatever is not of service ought to be*

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^d In longis morbis solum vertere convenit. *Epid. lib. vi. Chapter. Tem. IX. p. 529.*

immediately changed: but in long ones, which as time produced them so it likewise cures them, a remedy is not to be immediately condemned because it does not give present relief; much less ought it to be left off, if it is found to be of the least service, because by time it will become more effectual^e. This is to be inculcated to the patients, nor ought they be flattered with the vain hope of a short cure: for if they are warned beforehand, they suffer the irksomeness both of the disease and of the cure with much more resolution, and put greater confidence in the physician who has never imposed upon them by vain promises.

At the same time it sufficiently appears, why many chronical diseases are altogether incurable. For if a purulent ulcer has quite consumed the liver, lungs, &c. who dares expect a cure in such a case? And since we see that a confirmed hard schirrhus in the external parts of the body, where the most effectual remedies can be immediately applied, are so seldom resolvable, but must be extirpated with a knife, lest it should degenerate into an incurable cancer; who can expect a cure, when there is such a tumour as this in the viscera?

These things being premised in general concerning Chronical Diseases, we now proceed to the history and cure of each of them.

Of the P A L S Y.

§. 1057. **A** P A L S Y is a lax immobility of a muscle, not to be overcome by any effort of the will or of the vital powers: sometimes there is an absolute insensibility of the part; sometimes a small degree of feeling remains, attended with a numbness, and a kind of pricking sensation.

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^e In acutis morbis cito mutetur, quod nihil prodest: in longis, quos tempus, ut facit, sic etiam solvit, non statim condemnetur, si quid non statim profuit: minus vero removeatur, si quid paulum saltem juvat, quia profectus tempore expletur. *Lib. iii. cap. 1. p. 112.*

A *Palsy* is so called from untying, ἀποτεπαινεῖν, as if it was a loosening of that which was before firm and strong: as if several large stones, bound together by a ring, should compose a solid pile, then the ring being loosened, they should fall asunder. Sometimes it is likewise called *paresis*, from παρημι, to *slacken*, signifying a slighter degree of palsy; in which there remains some motion, but not constant; some degree of feeling, but dull. We sometimes see something like this happen in acute diseases; and Hippocrates^a, in his *Epidemics*, has remarked the same: for he observed in a certain patient, that about the fourteenth day of a coma, he was seized with a rigor without trembling, a *loosening*, *slackening*, a *giving way*, διαλυσις, παρεσις, συμπτωσις; and in another he says there was a loosening of his hands and feet, where he makes use of the word καταλυσις. But Aretæus^b, after saying, *Apoplexia, paraplegia, paresis, paralysis, omnia genere eadem sunt; aut enim motionis, aut tactus, aut utriusque, defectus est*; “The apoplexy, paraplegia, “paresis, and palsy, are all of the same kind; for “they are either a loss of motion, or of feeling, or “of both”——soon after subjoins, *Urinae autem in vesica aut suppressio, aut retinendi impotentia, paresis proprie est*; “But a suppression of urine in the bladder, or an involuntary excretion of it, is properly “a paresis.”

But a palsy is said to be a “*lax immobility* of a muscle,” to distinguish it from a tetanos, in which all the parts are *rigid* and immoveable. But in a sound sleep the action of all the voluntary muscles ceases, and yet the person at that time is not said to be paralytic, because, if he is roused out of his sleep by any cause whatever, he can put his muscles in motion at the first effort of the will. There are likewise other muscular motions in the body, which are not subject to the command of the will, but depend upon that part of the brain which serves for the spontaneous vital and natural motions; hence the muscles destined for these

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^a Lib. iv. textu 42. Charter. Tom. IX. p. 327. et textu 48. ibid. p. 330.

^b De Causis et Signis Morb. Diurni. lib. i. cap. 7. p. 33.

motions may likewise become paralytic, (see the comment to §. 1062); and then also that immobility cannot be overcome by any effort of the vital powers.

It is known from physiology, that some nerves serve for the sense of feeling, and others for motion, which, though they are very different in their origin within the brain, yet, being collected into the greater trunks of the nerves, are sent together to the different parts of the body. Wherefore the function of the motory nerves may be hindered, while the nerves for feeling remain quite unhurt, or at least not so much; and the contrary. It has been already observed of the palsy, that frequently the sense of feeling remains in the part affected, although for the most part it is rendered duller, attended with a disagreeable kind of sensation, and a gentle pricking pain, or a sense as if something was crawling upon the part. Sometimes, though more rarely, the feeling is entirely abolished together with the motion; and this is a bad sign, as will be said afterwards in the comment to §. 1062. Hoffman^c relates such a case of a youth, who was seized with a palsy of all the parts below the navel, even to his toes, by a sudden fright; all sense of feeling at the same time being abolished, so that his feet were very much burnt without any pain, and he only discovered his misfortune by the smell of the burnt skin: and the most effectual remedies having been used in vain, he died in about two years.

But it has likewise been observed, that the *feeling* alone has been lost, from the same causes which by destroying the *motion*, produced a palsy. It will appear afterwards in the comment to §. 1060, that a cold humidity is deservedly reckoned among the causes of the palsy. But Galen^d has observed, that the feeling in the skin of the head was very much hurt, in a person who, when he was walking in a violent wind and rain, had his cloak which was wrapt about his neck rendered so wet, that he perceived he had caught a violent cold in that part. In a soldier, the sense of feeling in the whole

^c Medic. Ration. System. Tom. IV. part. iv. p. 27. Affectis, lib. iv. cap. 7. Charter. Tom. VII. p. 465.

^d De Locis

whole left arm was entirely lost; though the motion of all the muscles remained perfectly free, so that he could handle his musket with this arm^e, altho' when his fingers were burnt to the bone he had not the least feeling of it. We read in the same place, of the like want of feeling, observed in a celebrated physician in the fingers of both his hands. But there is still a more surprising observation^f of a person, who had one arm quite paralytic, the feeling in the mean time remaining entire in it; while the other was perfectly void of feeling, but still it enjoyed its natural motion. Wherefore in those cases there is as it were a palsy of the nerves destined for feeling. In the mean while, such a disease is not usually called a palsy, *quae motus tantum fere est actionisque defectio; quod si nonnunquam solus tactus deficiat (rarum autem hoc est) potius insensibilitas (ααιδνσία,) quam paresis nominatur—* “ which (as Aretæus^g very well remarks) is only a defect of motion and action; but if sometimes the feeling alone is lost (which happens but seldom) it is rather called an *insensibility* than a palsy.”

§. 1058. **T**HE immediate cause of this disease is always, An obstruction of the nervous fluid in its course from the brain to the paralytic muscle, or of the arterial fluid in its course the same way.

It is demonstrated in physiology^a, that the cause of muscular motion ought to be capable of being present or absent in a muscle, and therefore must be derived elsewhere to it. But the nerves and arteries are those vessels by which that cause which produces muscular motion may be conveyed to the muscles. Now as muscular motion is performed at the command of the will with so much celerity, that there is no observable difference as to time between that *will* in the mind and the *motion* in the body thereby produced; and as our will

^e Acad. des Sciences, l'an 1743. Hist. p. 127, 130.
de la structure du coeur, Tom. II. p. 291.
Signis Morbor. Diurn. lib. i. cap. 7. p. 33.
Instit. Med. sect. 401, 402.

^f Senac
^g De Causis et
^a H. Boerh.

will has no direct power over the motion of the blood through the arteries: hence the cause of muscular motion seems to be chiefly derived from the brain through the nerves to the muscles. Whence a palsy has for its immediate cause, an obstruction of the course of the nervous fluid from the brain to the paralytic muscles. In the places here quoted some beautiful experiments are related, which confirm this opinion.

But it likewise appears, that if an artery going to a muscle, and alone supplying that muscle, is tied or cut, a palsy follows; and that likewise after death, by injecting hot water into an artery, the contraction of a muscle can be renewed: hence it is concluded, that the ingress of the arterial fluid into a muscle is necessary in order to produce muscular motion. But here it is to be considered, that there is required a proper structure of a muscle in order that the cause of motion applied to it by the nerves may produce that effect: but Ruysch's injections have demonstrated, that there is such a number of arteries in a muscle, that it appears to be almost entirely composed of them; and therefore, the artery being tied, the greatest part of the muscle remains flaccid, from the vessels being collapsed, while the veins likewise are no longer supplied by the arteries, and therefore collapsed also. But while in a dead body the arteries, being filled with hot water injected by a syringe, become suddenly turgid, it is no wonder if the swelled vessels, increased in their width, are diminished in their length, and so the muscle is contracted, and moves the part affixed to it: but in health the blood flows with an equal motion through the arteries of the muscles, even in persons who are asleep, when the action of the voluntary muscles ceases; neither are the muscles contracted without the command of the will, although the motion of the blood be increased by violent exercise, a fever, or other causes of the like nature. Whence it appears, that the arteries indeed contribute to muscular motion, in as far as they constitute a considerable part of the fabric of the muscles; but that the cause, exciting this muscular motion at the command of the will, is derived from

the brain by the nerves to the muscles.

For that a palsy may likewise be occasioned by a fault of the muscular fabric, appears from the dissection of a paralytic leg, in which the greatest part of the muscles had degenerated into a confused mass, resembling that which is usually observed in a steatoma^b.

§. 1059. **W**HEREFORE it may arise, 1. From every cause which produces the apoplexy (1010); 2. From whatever renders the nerve unfit for transmitting the animal spirit; 3. From whatever hinders the entry of the arterial blood into the muscles. Hence is understood the nature of a Paraplegia, Hemiplegia, and a palsy of a particular part.

1.] As an apoplexy is a cessation of all voluntary motion, it may be considered as a kind of general palsy; and therefore, every cause producing the apoplexy may likewise produce a palsy. But the like causes, which, affecting the whole common sensory, occasion an apoplexy, may likewise produce palsies of particular parts, provided that part of the common sensory only is affected from whence arise the nerves which are sent to the paralytic part. So it is frequently observed, that a palsy of the muscles in either side of the face precedes an apoplexy, when the morbid cause has not yet hurt the whole common sensory, but only a part of it: and on the contrary, a pretty violent apoplexy (see §. 1018.) usually terminates in a palsy of some muscular part, when the cause of the apoplexy is not entirely removed, but only in some measure. But practical observations likewise confirm, that such particular palsies may arise from a cause seated in the head. Thus we read of a boy^a, who, after a fall, had his hands and arms and some of the muscles of his head rendered paralytic; so that his head sometimes nodded forward, and

^b Gothofred. Salzman. D. M. Argentor. Dissert. Medic. &c. 1734. Journal des Sçavans 1735. Decem. p. 485. ^a Acad. des Sciences, Jan 1741. Hist. p. 104.

and sometimes backward, whenever he bent his body one way or the other. Another more remarkable case we have of a woman, who was seized with pains in different parts of her head successively, and a palsy followed in different parts of the body according as the pain happened to change its seat^b; but the sense of feeling remained in the paralytic parts.

2.] For as the cause of muscular motion is derived from the brain by the nerves to the muscles; hence palsies may be produced from all those causes, which can obstruct any part of the nerves in their progress to the muscles, although the whole brain is sound, and the muscles likewise. Thus I have seen the subaxillary glands, swelled and schirrhous, produce a palsy of the arm; its motion being gradually diminished, and at last quite abolished: and likewise tumours arising in the coats of the nerves may produce the same disease, as we shall see in the following aphorism.

3.] Of this we treated in the preceding aphorism. Thus, in the cure of an aneurism of the arm, while, by the trunk of the brachial artery being tied, the passage of the blood unto the muscles below it is hindered, or at least considerably diminished, surgeons have observed a numbness of the hand, and sometimes a palsy in some of the fingers; which complaints however have afterwards disappeared, when the branches which go off from the artery above the ligature, being gradually more dilated, conveyed a proper quantity of blood to the hand.

Concerning the nature of the paraplegia, hemiplegia, and palsy of a particular part, as also in what sense these names are commonly understood, we treated before in the comment to §. 1018.

But it was remarked in the preceding aphorism, that a palsy may be occasioned by a fault in the muscular fabric, although the nerves and arteries conveying the liquids to the muscles should perform their office properly. In corpulent persons, the muscles, being compressed by too much fat, which not only surrounds them, but is likewise interposed every where between
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^b Ibid. Pan 1742. Hist. p. 53.

the muscular fibres, become frequently languid. Nay, it appears very probable, that such a laxity may be produced in the muscular fibres, as to hinder them from performing their functions: For a muscle when in action swells and grows turgid, while the cause of muscular motion flows from the brain through the nerves: hence a due resistance is required in the sides of those small vessels, whereby they may withstand the impelled fluid, otherwise they would rather be elongated then distended; but this too great flaccidity physicians have called a *weakness* of the muscles. So also we observe in very strong men the muscular flesh quite firm, whereas in weak persons it is flaccid. Hence likewise, if certain muscles of the body are long macerated, either by too frequent bathing, or by a collection of water in the part, they lose their strength, and frequently are rendered quite paralytic. Thus a fatal lientery sometimes follows an ascites, occasioned by the intestines, quite wasted as it were by long maceration, losing their strength. Hence likewise, in the following aphorism, the too frequent use of warm water is reckoned amongst the causes of the palsy.

§. 1060. **T**HEREFORE a palsy may have for its cause, An apoplexy; a gentler kind of parapoplexy (§. 1009, 1010, 1015); an epilepsy; convulsions; a violent and long continued pain; a retention of the usual evacuations, *viz.* the hæmorrhoids, menstrua, abscesses, fistulæ, stools, urine, and saliva, with a subsequent vertigo; metastases of any kind of morbid matter, in acute or chronical diseases; whatever by obstructing, breaking, compressing, binding, distorting, over-stretching, or constricting, hurts the nerves; and therefore thick humours, wounds, erosions, abscesses, mortifications, and inflammatory tumours, in the coats of the nervous medulla, their ganglions, and in the nerves

themselves, both serous, purulent, ichorous, and the like; strong and tight ligatures, fractures, and luxations; very astringent aliments, medicines, and poisons; hence violent cold, excessive heat, a cold humidity, too plentiful and frequent use of hot water, the vapour of arsenic, antimony, quick-lime, mercury, and of other poisons, may all produce a palsy.

As in the preceding aphorism the general causes of the palsy were enumerated; it follows now, that we come to inquire into its principal and particular causes.

An apoplexy, &c.] Of this we treated a little before. But as in the epilepsy, as will afterwards appear, the brain is so much hurt; and likewise in this disease, as also in convulsions, such horrid distortions of the limbs are occasioned; it is no wonder that the palsy should follow those diseases, either on account of the common sensory and nerves being hurt, or sometimes also from the fabric of the muscles suffering by their being so frequently and violently distorted. In practice it most certainly often occurs, that children after strong convulsions become paralytic; and frequently remain so ever after, in spite of all the best remedies than can be applied.

A violent and long-continued pain.] From what was said in the comment to §. 220, *et seq.* it appeared, that pain is then felt, when a nervous fibre is so strained, that a dissolution of it is threatened; and that the pain is so much the more violent, the nearer the over-stretched nervous fibre approaches to a rupture. Wherefore, violent and long-continued pain denotes, that a destruction of the nerve is threatened. It is true indeed, that the action of the nerves which give feeling to the parts may be hurt, nay quite abolished, while the functions depending upon the motory nerves of that part may remain entire, as was said in the comment to §. 1057; and therefore it appears, that those nerves remain distinct both in their origin, and their whole course: But in the mean time, both the
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sentient and motory nerves are bound up together in the larger trunks; and therefore, after a violent and long-continued pain, near the larger nervous branches, there is reason to fear, lest the cause exciting pain should likewise act upon the nerves of *motion*, being so closely connected with those of *feeling*. Thus I have seen, from an obstinate pain about the last vertebra of the loins, an incurable palsy of the legs and thighs follow. Besides, it must be observed, that such sharp and continued pains must hinder every motion of the part affected, and often of the neighbouring parts likewise; whence the muscles, being kept without motion a long time, are disposed to a palsy. This we see evidently in women, who have a very bad custom of lacing their bodies in stays, made of whalebone, frequently both day and night: in these the whole trunk of the body is kept firm by the stays, which, girding the belly tight, bear upon the bones of the ilium, and at the same time prop up the axillæ: hence the strong muscles of the back, which serve to raise and keep the trunk of the body erect, are kept without action; and as the same muscles scarce act while a person is lying in bed, hence, although the stays are laid aside in the night-time, yet the muscles remain almost without action. For this reason those wretched women, who have been accustomed to use these stays from their childhood, cannot afterwards lay them aside, but the whole trunk of their body will fall forwards, the muscles of the back being rendered inactive, which in a strong labouring person keep the spine firm and erect although a heavy load is laid upon the shoulders, as we see in porters. I have seen not without pity such wretched women, who durst not leave off their stays even in the night-time, having frequently experienced that they could hardly turn themselves in bed, much less raise themselves up in it, or support themselves upright without them. For this reason a slight palsy of the lower extremities seems sometimes to follow a rheumatic lumbago (which however, by degrees, is cured by friction), while often for several weeks they dare not attempt the least motion

in those parts. The famous Boerhaave, after suffering this painful disease for a good many weeks, was deprived of the use of his limbs, after the pain had left him: but by using strong frictions, he got rid of it entirely, and indeed in a short time, which seldom or never happens so soon in a palsy, when it is produced from an impeded influx of the spirits thro' the nerves. Whence it appears, that this paralytic complaint, just now mentioned, was occasioned by an unactive flaccidity of the muscles, which had remained so long without motion.

All the usual evacuations retained, &c.] These usual evacuations are either of a good and natural humour, only hurtful by its quantity if it is retained in the body; or of an useless and morbid humour, which being retained not only increases the quantity, but disturbs the whole body by its vicious quality. The hæmorrhoids, menstrua, and wholesome saliva, belong to the former class; to the latter, morbid saliva, and those evacuations which are made by stool and urine, abscesses, and fistulæ.

Thus we see, that persons who live plentifully, and do not consume what they eat and drink by violent exercise, if the viscera are strong, become plethoric: frequently, in such persons, that overplus is sent off by the hæmorrhoidal vessels; nay, in many this happens at stated intervals; and then they are very healthy. But if this usual evacuation does not go on, diseases of the head very soon follow; amongst which a vertigo, as was said before, usually leads the van, indicating that the blood-vessels of the brain are then too much filled, and that the functions of the common sensory begin to be disturbed. Whence Hippocrates, as was mentioned in the comment to §. 1017, warns a parapoplectic person what he is to fear, if a vertigo follows upon too small a discharge of the hæmorrhoids. For then nature indeed attempts to evacuate what is superfluous, but is not able to perfect it; and the blood, not being suffered to escape through these lower vessels, acts upon and distends those in the upper parts of the body. The same case happens in women, if
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the menſtrua are ſuppreſſed: and the head is almoſt always obſerved to be affected, while that evacuation is approaching; and likewise when it flows more ſparingly than uſual though the perſon abounds with blood, as was ſaid before in the comment to §. 1040.

But what dangerous and various diſeaſes may happen from pus, or ichor, collected in abſceſſes and fiſtulæ, and reſorbed into the blood, was obſerved before in the comment to §. 406. In this caſe, if a vertigo ſhews that reſorbed purulent or ichorus matter to be determined towards the head, it eaſily appears, that not only a paſſy, but likewise an apoplexy may thence follow, ſuddenly mortal.

As by ſtool thoſe parts of the aliments are evacuated, which, being uſeleſs to the body, would hurt it if they were left to remain longer in it, ſeeing they are half putrid; and the thinner part of them, being taken up by the abſorbent veins of the large inteſtines, may be mixed with the blood; the reaſon is plain why the body's being long conſtipated may diſturb the functions of the brain, and therefore occaſion a paſſy. Hence Hippocrates condemned coſtivenefs in fevers; and likewise white ſtools, becauſe then that bilious matter which uſually tinges the excrements remained in the body, and he foreſaw that the worſt kinds of diſeaſes of the head muſt thence follow; as was explained at large in the comment to §. 772, where we treated of the Frenzy.

An obſtruction of the urine is ſtill more dangerous, eſpecially if there be a perfect iſchury in the caſe, which is uſually ſooner mortal than a ſuppreſſion by ſtool, and of which when perſons die, ſuch ſymptoms always precede, as demonſtrate the functions of the brain to be hurt. For as by urine the ſalts and oils of the blood, rendered acrid, are waſhed off together with the ſuperfluous watery parts, a ſuppreſſion of that evacuation hurts in a double capacity, both on account of what is acrid being retained, and the watery part being not ſufficiently evacuated, which then is uſually collected in the cavities of the body, as will appear afterwards in the chapter upon the Dropſy, where too

small an excretion of urine is condemned as a bad omen considered both as a sign and a cause.

The usual evacuation of saliva being suppressed, likewise deserves to be reckoned among the causes of the palsy. For it appears from physiology ^a, that the saliva is secreted from the arterial blood, which is contained in the carotids, that, being mixed with the food in the time of chewing, it may be swallowed, and serve to perfect chylification. And indeed there is no small quantity of saliva secreted, as appears from practical observations. For in a soldier who had only one of the parotid ducts cut through, and afterwards the wound was partially united in such a manner, that the secreted saliva did not run into the mouth, but dribbled down outwardly upon the chin through a fistulous aperture; in the time of dinner, though he was only a short while about it, the saliva which flowed out wetted several linen cloths ^b. If now we consider, that the like quantity is secreted by the parotid of the other side; that the maxillary and sublingual glands likewise serve for the secretion of saliva; and that the like humour, but thinner, is discharged by the mouths of the arteries, in every point of the internal surface of the mouth and fauces; it will appear what a great quantity of saliva is secreted: especially if we consider at the same time, that the saliva is evacuated from these excretory ducts, not only in the time of manducation, but night and day, altho' in smaller quantity than while we are chewing. But as the organs which secrete and excrete the saliva receive their blood from branches of the external carotid artery, it is plain, that, the excretion of saliva being hindered, the branches of the internal carotid must be more filled, and at the same time the blood which is to flow through the vessels of the brain will not be freed of that viscid mucous matter which is separated by the salivary ducts. Wherefore, all the functions of the brain might be disturbed, and likewise a palsy be produced, from this cause only. For this reason,

^a H. Boerh. Instit. Med. sect. 66. et 235.
Sciences, 1719. Mem. p. 452.

^b Academ. des

reason, skilful physicians are always afraid of light-headedness and frenzy, if the patient's mouth is very dry in acute diseases: but when the morbid matter is carried off in some diseases by a plentiful spitting, then still worse evils may be foreseen if that excretion of saliva suddenly ceases. In the small-pox, as will be said afterwards, an untimely suppression of the spitting is so bad an omen upon this account; that immediately such patients begin to be torpid and heavy, and sometimes delirious, and for the most part suddenly die.

Metastases of any kind of morbid matter in acute or chronical diseases.] It appeared in the history of Fevers (§. 593.) that the morbid matter, after it was concocted and rendered moveable by the fever, was not always evacuated, but sometimes deposited in various parts of the body, and so produced a new disease. The truth of this was afterwards confirmed, in the history of Acute Diseases, by several practical observations. If therefore such a metastasis of the morbid matter is produced, either in the brain, or the medulla spinalis, or in the nerves going out from thence, it easily appears that a palsy must thereby be occasioned. Besides, we observe, that sometimes, in acute diseases, the morbid matter, deposited in certain parts of the body, occasions sudden and large tumours, which, by compressing the neighbouring nerves, may produce a palsy. I have seen such tumours frequently arise under the axillæ in acute diseases, and more frequently in persons otherwise in health: which tumours, when they were suppurating, compressed the subaxillary nerves by their bulk, so as to produce a numbness in the arm, and a great weakness in the muscular motion, till, by the abscess breaking, that compression of the nerves was taken off. Farther, after inflammatory diseases of the head, there sometimes remain incurable complaints, from a part of the medulla of the brain being rendered unfit for transmitting the spirits to the nerves, on account of its having been compressed by the inflammatory tumour. I have seen a true amaurosis, and deafness, left after acute disease, which
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could not be cured by any medicines whatever. If such a complaint should arise near the origin of the nerves which serve for muscular motion, an incurable palsy would thereby be produced. Besides, it was demonstrated in the comment to §. 1018, that an apoplexy somewhat violent frequently terminates in a palsy; nay, that patients hardly escape from this acute and dangerous disease, but there remains some hurt or other in the functions of the brain.

The same is likewise true in chronical diseases. It will appear afterwards (§. 1104.) when we come to treat of Melancholy, that the artrabiliary humour dissolved and set afloat, amongst other bad diseases likewise produces a palsy. The same effect is observed in the worst kind of Scurvy, §. 1151, n^o 4; as likewise from the gouty matter, when it is no longer deposited in the usual places, *viz.* the extremities (see §. 1273). But there is no chronical disease which the palsey more frequently follows, than the colic of Poic-tou: in which disease, after most tormenting pains of the belly, in several repeated paroxysms, a palsy follows, sometimes of the upper extremities, sometimes of the lower; and when this last appears, the pains of the belly frequently cease, or at least are considerably abated. I have had frequent occasions of seeing this wonderful disease; and though I will not deny that it may arise from other causes, yet I have ofteneft observed it in persons who are occupied in melting of lead, preparing of cerufs, rubbing it, &c. I once saw a whole family taken ill of it, from water, which they had for common use, having stood a long time in a leaden cistern. I have observed it most frequently in opulent persons, who buy the richest wines for their own drinking at a great price; which perhaps have been sweetened with lead, as we know was formerly done by some knavish vintners. I likewise saw, not long ago, a young nobleman, who, by taking a drachm of lead in an emulsion every day, for ten days running, fell into this disease, and very narrowly escaped with his life. Hence I think it sufficiently evident, that from the vapours of lead, and its different calxes, ei-
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ther long handled, or received into the body, the colic of Poictou may be occasioned: although perhaps it may likewise arise from other causes; for I have seen other persons miserably tormented with this disease, in which, after the most accurate examination, I could not discover that it was owing to any thing of lead. Besides, this colic is so frequent in the south parts of America, that it may be almost reckoned an endemic disease there; as I have frequently been told by the learned doctor William Bull, who was born in that country, and now practises physic there with great success. He likewise published a very ingenious thesis upon this disease, which he defended in the Academy at Leyden in the year 1734. But it is usually the fate of those theses, that after a few years they are nowhere to be found. Hence the celebrated Haller, to whom the learned world is so much obliged for his works, has with a laudable intention collected several of the best of them, and caused them to be reprinted. There is a small but useful treatise^a, on the cure of this obstinate disease, in which likewise the chief authors who have written upon it are mentioned. *Ægineta*, the most ancient physician that I know who has treated of it, confirms by his authority, that the palsy is produced in this disease by a metastasis of the morbid matter: “ Of late years the colic has been
“ a very troublesome disease, of which those who
“ have recovered have been quite deprived of the use
“ of their limbs after it; but the sense of touch re-
“ mained unhurt, so that it appeared to be owing to
“ a critical metastasis from the internal parts of the
“ body,^b &c. And elsewhere, treating of the same disease, which he says infested Italy and other places epidemically: “ From which many have fallen into
“ the epilepsy; others into a palsy of the limbs, the
“ sense of feeling still remaining; and some into both
“ those diseases at once. Of those who fell into the
“ epilepsy, a great many died; but of those who were
“ seized with the palsy, several recovered, as if by a
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^a A. de Haen Medic. Haga-Batavi de colica Pictonum, Hagæ Comit. 1745.

^b Lib. iii. cap. 18. p 31.

“ critical metastasis of the cause of the disease.” In the mean while I must own, that to me it appears doubtful, whether that palsy was occasioned by a metastasis of the morbid matter from the belly to the limbs; or from that surprising sympathy, by which some parts of the body are affected with the disease acting upon others, even at a great distance, (concerning which we treated before in the comment to §. 701.) I very well remember, that I have cured a great many, without applying any remedy to the paralytic parts themselves to discuss the matter, but only by ordering internal medicines, together with frictions, aromatic ointments, and plasters of the same kind, applied to the belly alone.

Whatever by obstructing, breaking, compressing, &c.] It was said in the second number of the preceding aphorism, “ That whatever renders a nerve unfit for transmitting the spirits, must occasion a palsy.” Whatever therefore produces a solution of continuity in a nerve, or by compression destroys its cavity, must produce a palsy of the muscle to which that nerve belonged. But whether a thicker humour, by obstructing the cavity of the nerve, can render it impervious, is not quite so evident. It was demonstrated before, in the comment to §. 119, that an obstruction can hardly take place except in vessels in which the fluids are moved from a wider to a narrower cavity. But it does not appear that the nerves are vessels of that kind. The larger nervous trunks, after sending off branches, decrease indeed in their bulk: but it appears, that they are only bundles of smaller nerves; neither have the most minute anatomists as yet found an end here, but it has always appeared that the smallest nervous fibril is composed of other smaller ones: which nerves do not seem to be conical, but every where of an equal thickness. The same thing is likewise confirmed from hence, that the nerves are also extremely slender at their origin from the medulla of the brain; contrary to what is observed in the arteries, which are largest at their origin, and decrease

crease in width as they proceed in their course. Besides, that fluid, which is secreted in the cortical substance of the brain, and is distributed to the medullary stamina, exceeds all comprehension in subtilty; hence it hardly appears probable, that, being conveyed to the nerves, it can thicken in such a manner as to obstruct their cavities. It is not unlikely, that in the origin of the medullary fibrils from the cortex, too thick a liquid may by an error of place (see §. 118.) enter the dilated cavities of such slender vessels, and there remain obstructed, from which cause palsies may arise, the nerves themselves continuing entire and pervious, but the cause of the disease being lodged near the origin of the nerves in the brain. Complaints of this kind, left after inflammatory diseases of the head, seem to authorise this doctrine. But it does not appear, that that liquid, after it has once entered the small cavities of the nerves, can so thicken as to produce an obstruction.

But all the nervous fibrils singly are wrapt up in coats, that, being naturally very delicate, they might be safely extended from the brain to the most distant parts of the body; and several of the smallest nerves are collected into one little bundle by means of an involving membrane, whereby the number of coats is multiplied. Anatomists have taught us, especially by injections, that innumerable small arteries creep upon those coats, which may be obstructed and inflamed. Farther, upon dissecting any of the larger nerves, there is found a cellular coat interposed between each of the fibres constituting that nerve; which coat is the most frequent seat of inflammation, as was said in the comment to §. 383. But we likewise know, that sometimes in a dropfy the extravasated lymph swells the cellular membrane over the whole body; and therefore the same may likewise happen in the interstices of the nerves, which are contiguous to each other. It appears therefore, that several diseases may have their seat in the coats of the nerves, by which their action may be hurt, or even entirely abolished, altho' there is nothing amiss in the *substance* of the nerves properly

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ly so called, but only in their coats: and, as will afterwards appear, perhaps those palsies only are curable, whose causes are not seated in the nerve itself, but in the membranes surrounding it; the vessels of which being distended, indeed compress the nerve, but do not entirely destroy it. The principal causes are mentioned in the text, which are capable of hurting the nerves in this manner; and likewise those which, by destroying the cohesion of a nerve, abolish its action.

Very astringent aliments, medicines, poisons.] Seeing a palsy was called “a lax immobility of the muscles,” §. 1057. it may appear at first surprising, why astringents, which were recommended at §. 28, n^o 4. for the cure of a weak and lax fibre, should here be enumerated amongst the causes of the palsy. It is certain that astringent remedies have this quality, that they make the solid fibres of the body cohere more firmly together; and they produce the same effect even in dead parts of animals, as was said in the comment to §. 28, n^o 4. and is confirmed by beautiful experiments made by the celebrated Mr Hales^d. But from thence it can only be concluded, that by the efficacy of astringent remedies, the spontaneous contractile force of the muscles is increased, which is quite different from the cause of muscular motion^e. But these same astringents (see §. 117.) unite closely the particles which compose our humours; and therefore may give origin to the most obstinate obstructions, and produce inflammations (§. 377.) if they are immediately applied to the nerves. At least we can easily understand, that such an injury may be produced in the vascular coats of the nerve; and so a palsy may be occasioned by diseases arising in the integuments of the nerves, as was said a little before. It is true indeed, that astringent aliments cannot reach the blood without difficulty, as by their proper quality they as it were shut themselves out from the mouths of the absorbent veins, by constricting them; and therefore it hardly appears probable,

^d Hæmæstatics, Experim. XVI. p. 131.
H. Boerhaave, §. 401.

^e Vide Instit. Med.

bable, that they can ever reach the small cavities of the nerves this way with their whole force: But it is certain, that these remedies, immediately applied to the nerves, are capable of disturbing their action. The juice of acacia applied to the tongue corrugates it in such a manner, that the taste is lost for some time. An imprudent application of the same kind of medicines to the eyes, has sometimes occasioned an incurable blindness. Besides, we see, that the children of peasants have their intestines obstructed, and their belly swelled, by eating four and unripe fruits. But it appears from physiology, that the passage of the aliments through the windings of the intestines is performed by their muscular fibres, which occasion the *peristaltic* motion, as it is called: as therefore, by taking those austere substances, the aliments must stick in the intestinal canal, and not be pushed forward towards the anus, it is plain, that by their effect the action of the muscular fibres of the intestines must be hindered, nay, sometimes entirely stopped; and then in a dead body all the intestines are found crammed and distended. But the astringent quality of the aliments acts with its whole force upon the stomach and intestines; hence prudence requires, that, in order to strengthen those parts when they happen to be too lax, such medicines should be given in a small dose, and frequently repeated, as was said before in the comment to §. 28, no 4. It was observed a little before, that the worst kinds of palsy were occasioned by the astringent calxes, and sugar of lead. Hence it appears, that astringents, altho' they may increase the cohesion of the solids, yet they are capable of hurting muscular motion.

Violent cold.] It was demonstrated formerly in the comment to §. 117, that the particles of our humours were united and concreted together by cold; and it was remarked in the comment to §. 454, that by violent cold a sudden mortification destroying every thing in its way, nay, even a sphacelus, may be produced: and therefore it is plain, that the nerves and muscles may be destroyed by cold alone. Hippocrates has said, "That the brain, and all the parts arising from it, are

“ hurt by cold, and cherished by heat ^f.” It is certain, that we see all animals grow benumbed in great cold; nay, some of them sleep all winter, entirely deprived of voluntary motion, and recover their former agility by the kindly warmth of the spring; the same thing happens to insects of the greatest agility. We observe in the human body, that a congeries of vessels, which carry warm red blood, are distributed every where to the medulla of the brain, oblongata, and spinalis, as also to the nerves; and thus prevent the cold from hurting those parts, which, being composed of very tender vessels, could not be kept warm by the attrition of the fluids against these vessels. Thus the pia mater, which is plentifully supplied with arteries, not only covers the brain and cerebellum, but inserts its double processes deep into the circumvolutions of those parts: in the ventricles of the brain the plexus choroidei, which are wholly vascular, are situated; and considerable blood-vessels run through the very medulla of the brain and cerebellum. The optic nerves in their whole course have arteries twisting round them; and even through their medullary substance an artery runs, whose branches are distributed upon the retina in the bottom of the eye. The third, fourth, and sixth pair of nerves, which are sent to the most agile muscles in the whole body, in their course from the medulla oblongata, pass through the cavernous sinuses of the dura mater, near the curvature of the carotid artery; the sixth likewise for the most part firmly adheres to the carotid: thus in their whole course they are cherished with warm blood. If on the other hand it is considered, that in lax and cold bodies, in whom the red blood is deficient, all the muscular motions languish, it will sufficiently appear, how much a healthy heat contributes to the agility of the body; and, on the contrary, that cold diminishes that agility, nay, if it is very strong, or has been long applied to any part of the body, it will render it paralytic. Thus Galen ^g observed, that the sphincters

^f De liquidorum usu, cap. 11. Charter. Tom. VI. p. 444.

^g De Locis Affectis, lib. i. cap. 6. Charter. Tom. VII. p. 400. et lib. iv. cap. 7. ibid. p. 465.

ers of the anus and bladder were rendered paralytic by persons sitting long upon cold stones, or having these parts long exposed to cold water in fishing: and the remarks, that the same complaint has likewise happened to some persons by swimming in cold water.

Excessive heat.] We have just now seen, what service a mild natural heat is of, in cherishing the nerves, and assisting all their actions: but when it is too much increased, it becomes very hurtful; for thereby the thinner fluids are dissipated, and what remains is rendered thicker and apt to produce morbid concretions. It likewise appears, that our humours are coagulated by great heat; hence heat is also reckoned amongst the causes of obstruction, §. 117. in as much as it unites the particles of our humours too closely, and so renders them unfit to pass freely through the narrow extremities of the vessels. But this thickness of our humours from too great heat, whereby they are rendered incapable of passing through the vessels, is not only occasioned by a dissipation of the more liquid parts, but likewise by the sudden coagulation from the heat. Thus the serum of the blood, dropt into hot water, immediately coagulates, and indeed in a much less degree of heat than that of boiling water. But as the bad effects of our humours when they are inspissated are soonest observed in the smallest vessels, such as those which constitute the fabric of the brain; hence physicians prognosticate the functions of the brain will be hurt, whenever a violent heat is observed in diseases. Hence therefore, in the pathology^b, where the bad effects of too hot an air are enumerated, it is observed, that the nervous and lymphatic system, and their actions, are thereby the soonest and most remarkably hurt: for this reason also it was remarked at §. 772, that a true Frenzy is preceded by a violent heat. But when a great heat is applied either to the head, or to any part of the body where the great nerves run, as sometimes happens to peasants sleeping in the sun; then the danger is so much the more increased.

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^b H. Boerh. Instit. Medic. §. 746.

Whence Hippocrates ⁱ has remarked, that persons are rendered parapoplectic, if the head is suddenly exposed to the heat of the sun, or to violent cold.

A cold humidity.] Sanctorius ^k has observed, that cold attended with *moisture* hurts insensible perspiration much more than when it is *dry*; and elsewhere ^l he has added, that in such an air the perspiration is converted into an ichor, which being retained, and afterwards not subacted, usually produces a cachexy. Hence we see, from such an air, colds in the head, catarrhs, and the like disorders arise, in which a great quantity of humours is discharged by the nose, or spit up in the form of phlegm; but that matter which is retained, if it is collected near the larger nerves, or their origin in the brain or spinal marrow, may hurt, or entirely destroy their action. For from hence arises a collection of serous humours in the body ^m, which Piso found to be so frequent a cause of the apoplexy and palsy, that he looked upon it as almost the only one in those diseases, as was said before in the history of the Apoplexy. Whence likewise Hippocrates ⁿ reckons apoplexies amongst the diseases frequent in a wet season. It was mentioned lately from Galen, that the sphincters of the anus and bladder were rendered paralytic by certain parts of the body being long exposed to cold water. Avenzoar ^o tells of himself, that upon his going a journey to visit a paralytic patient, in cold rainy windy weather, and having exposed his left foot, which was too thinly covered, to the wind and rain for a long time, that part was seized with a palsy, together with the loss of feeling. However, it was happily and very soon removed by the heat of a great fire, and bathing it with a hot aromatic liniment, seeing it was only topical and recent.

Too plentiful and frequent use of hot water.] It was said before in the comment to §. 1059, that such a laxity may be produced in the muscular fibres as to

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ⁱ De Aere, Locis, et Aquis, textu 14. Charter. Tom. VI. p. 191.
^k Aphor. 67. ^l Aphor. 146. ^m H. Boerh. Instit. Medic. §. 743.
ⁿ Aphor. 16. sect. iii. Charter. Tom. IX. p. 109. ^o Apud
 Zacut. Lusitan. hist. 47. p. 84. Tom. I.

render them incapable of performing their office, and that from such a relaxation of the muscles a palsy may arise. But it was demonstrated in the comment to §. 30, that watery substances very much weaken the solid fibres of the body: and at the same time it was then remarked from Hippocrates, that from too plentiful use of hot water, “a relaxation of the fibres, inability of the nerves, and a numbness, were to be feared.” Towards the close of the last century some physicians were of opinion, that the health was most confirmed, when the blood and all the humours were thinnest; and therefore they inculcated to every body, that the blood could not be too much diluted: thus they persuaded healthy persons, to sip large quantities daily of hot liquors, such as tea, coffee, and the like. I have seen a great many so enervated by drinking too freely of those liquors that they could hardly move their limbs, and likewise several who were seized with the apoplexy and palsy from that cause. For thus at length all the viscera and vessels are relaxed, so that a sufficient quantity of spirits requisite for muscular motion cannot be secreted; and at the same time that relaxation is communicated to the muscles from the same cause. A like laxity is also occasioned by hot and moist air, if it continues long in that state: and Hippocrates has remarked, that paraplegiæ were frequently epidemical after a south wind and rain^p.

The vapours of arsenic, antimony, &c.] It appeared before, in enumerating the causes of the apoplexy, §. 1010, No V. that such poisonous vapours were capable of destroying the actions of all the nerves which are destined for the animal-functions, by bringing on an apoplexy; at the same time it likewise appeared from the observations there mentioned, that a palsy might be thereby also produced. What was said of the palsy following the colic of Poictou, in the same paragraph, shewed that the vapour of lead frequently produces a palsy. We frequently find persons rendered paralytic, by exposing themselves imprudently to quicksilver dispersed into vapours by the fire, as

gilders, chemists, miners, &c. and perhaps there are other poisons which may produce the same disease even externally applied. I shall only give one instance, to confirm this opinion. A lady of quality applied a little bit of a fresh leaf of that kind of nightshade which is commonly called *Bella Donna*, to a small ulcer below her eye, which was suspected to be cancerous; and in a night's time the pupil of the eye lost all its motion, remaining quite dilated, even while the eye was exposed to a strong light: but the nightshade being removed, the motion of the pupil gradually returned. Ray⁹ affirms, that he saw this case: neither did it happen accidentally; for three different times, while he repeated the application of the nightshade, the same effect constantly followed. Nay farther, after the cancerous ulcer was eradicated and cured, the surgeon put a bit of the same leaf to the part where the ulcer had been, in order to repel the humours, and prevent their falling upon it afresh; but it was followed again by the same dilatation of the pupil. Galen^r asserts, that he has frequently observed the same bad effect from the imprudent application of opium, mandrake, and henbane, to relieve violent pains of the eyes.

Having thus discussed the cause of the palsy, we come next to consider the effects which are produced by it.

§. 1061. **T**HE immediate (1058), and remote cause (1059, 1060.) of a palsy, and therefore the disease itself arising from these, produces very different effects, according to the variety of the seat where that cause is lodged; the variety of its magnitude; the time it remains there; and the various nature of the part affected, as it is more or less necessary to life, or more immediately necessary, or the contrary; from whence it

⁹ Histor. Plantar. lib. xiii. cap. 23. p. 680.
lib. iii. cap. 11. Charter. Tom. X. p. 58.

^r Method. Medend.

it may be reckoned mortal, less mortal, curable, or incurable.

From what has hitherto been said concerning the immediate and remote causes of the palsy, it appears, that they may be lodged in different parts of the body, while they produce this disease. Hence it is proper to inquire first into the seat where that cause is lodged, that hereby a just prognosis, and a proper method of cure, may be discovered. For the cause of a palsy of the leg, *v. g.* may be lodged in the brain itself, in the spinal marrow, and in the great nervous trunk which is made up of the collected branches of nerves going out of the extremity of the medulla spinalis. But quite other effects are to be feared from the same cause, if it is seated in the brain, than if in the crural nerve: for this cause being propagated to the neighbouring parts of the brain, which have a connection with other parts of the body, may produce new complaints; whereas, in the crural nerve, it can only hurt the functions of those muscles to which that nerve is distributed. Besides, the cause obstructing the function of the nerve may either be seated in the *coats* only, or likewise in the *substance* of the nerve properly so called: whence again a different prognosis arises; because frequently the cause of the palsy, seated in the teguments of the nerves may be removed by art, but when it occupies the substance of the nerve itself it is seldom or never cured. But how the particular seat of this cause may be discovered, shall be said afterwards in the comment to §. 1070.

But likewise from the variety of the magnitude of the cause which produces a palsy, another prognostic is derived. If one of the vertebra of the loins is only a little removed from its natural situation, as it only presses the spinal marrow very gently, there remains hope of a cure: but if it be forced a good deal inwards, the spinal marrow is thereby frequently quite destroyed, and in this case a cure cannot be expected. The magnitude of the cause is likewise judged from its being easily removed, or the contrary. The palsy
arising

arising from a plethora may be much sooner cured, than that which is produced from an accumulation of serous humours in the brain. That palsy of the pupil which followed upon the application of the nightshade to the ulcer above mentioned, was easily cured by removing the cause.

The part affected likewise occasions a new diversity of the effects of the palsy, according to its uses. Thus a palsy of the arm may be much longer endured, than of the intestines; seeing by the last the digestion of the aliments must be hindered, with the ingress of the chyle into the blood, requisite to preserve the nourishment of the body. From all these circumstances rightly considered, we may foresee what is to be feared or hoped for in a palsy, of which we shall treat in the following section.

§. 1062. **A** PALSY of the heart, lungs, muscles of respiration, and gullet, is quickly fatal; of the stomach, intestines, and bladder, from internal causes, very dangerous; of the muscles of the face bad, and easily changed into an apoplexy. A paraplegia is very dangerous, the fore-runner of an apoplexy, which coming upon it is mortal; and an hemiplegia is bad, akin to the paraplegia, whence a fatal apoplexy; which if it begins with a coldness, insensibility, and wasting of the part, is bad, and seldom curable; if with a strong convulsion, and a great heat in the opposite part, it is also bad: but from the opposite circumstances to these we know which kind of apoplexy is curable, which less to be feared, and which is so often the cause of a sudden and unforeseen death without almost any concomitant symptom.

[Of the heart.] It is proved in physiology^a, that the heart is a true muscle, and acts with a muscular force; and

^a H. Boerhaave Instit. Med. sect. 187.

and therefore it may suffer a palsy, like all the rest of the muscles, if the application of the cause of muscular motion to the heart be any ways hindered. It is true indeed, that the heart has some properties, which are not found in other muscles: for even after it has been cut out of the body, it continues to move for some time; and when it has ceased after death, its action may be renewed by irritation, (see §. 1.) In the mean while, the anatomical dissection of the heart teaches us, that there is a like structure in this viscus as in other parts of the body; that a number of nerves are distributed to it; that two arteries, large in respect to the size of the heart, throw the blood briskly thro' its whole substance; and therefore that the most powerful causes of muscular motion are found here. The opening of living animals demonstrates to us, that the heart becomes pale while it acts, like the rest of the muscles of the body. Hence it appears, that the heart possesses some peculiar qualities, which are proper to itself only; and has, besides, all those which are found in other muscles, and therefore it may suffer like diseases from the like causes. Violent and sudden affections of the mind sometimes render all the muscles so paralytic, that they are no longer able to support the body, so that the person falls down; and at the same time a syncope, or inaction of the heart, almost always follows. Hence the wise Homer^b, when Penelope is informed of the departure of her son, and the treachery of her suitors, has joined these two, saying,

— — — της δ' αὐτὴ λυτο γυναιξὶ φίλον πτορ.

But the heart in a syncope is exactly in the same condition as was said, §. 1057, in the definition of a palsy, which was called “ a lax immobility of a muscle, not “ to be overcome by any effort of the will or of the “ vital powers.” But as the heart is so stimulated by the venous blood flowing into its cavities as to be contracted anew, that palsy of the heart which was begun is frequently removed, and many who have fallen into a syncope have recovered, by having their limbs rubbed,

bed, the breast and face sprinkled with cold water, and stimulating medicines held under the nose, &c. by all which the venous blood is driven towards the heart. Sometimes, however, from a violent and sudden affection of the mind, a mortal palsy of the heart follows. While every body admired the bravery of a soldier in battle, and were very much grieved when at last they saw him fall, his arms were taken away after he was dead, that they might know who he was. A nobleman (whose posterity is still in great esteem, and confirmed to me the truth of this fact) came running amongst the rest, and seeing it was his son, he grew stiff with his eyes open, and immediately fell down dead^c. Observations likewise teach us, that a syncope follows, while the external surface of the heart is touched by any extraneous body, or if by a wound or ulcer penetrating the pericardium the bare heart is exposed. For while a celebrated surgeon, thrusting his finger through the aperture of an ulcer, touched the heart, a syncope followed^d. Whence the pericardium, firmly connected to the diaphragm, jugulum, and sternum, incloses the whole heart, with the auricles, sinuses, and the larger trunks of the vessels which enter the heart, and also of those which go out of it, defending it from the hard surrounding parts, that while it is moved, it may not strike upon them and hurt itself, or at least be disturbed in its motion; the continuance and equability of which is so necessary to life.

Of the lungs and the muscles of respiration.] It appears from physiology^e, that the lungs, when upon opening the thorax they are exposed to the external air, collapse into a smaller space than they occupied before the thorax was opened, which was chiefly owing to the action of the muscular fibres, connecting the ringlet segments of the bronchia; which therefore resist the dilation of the lungs in inspiration, and promote the expulsion of the air from them in expiration. If therefore a palsy should happen in those muscles or fibres,

^c Essais de Montagne, lib. i. chap. 11. Tom. I. p. 7. ^d Senac. de Corde lib. iv. cap. 5. Tom. II. p. 344. ^e H. Boerhaave Instit. Medic. sect. 602. et seq.

fibres, which are called mesochondriac, the expiration will be more difficult, and the lungs will remain distended with air, neither will they allow new air to be inspired. But as that alternate dilatation and contraction of the lungs is requisite to allow a free passage for the blood to go from the right ventricle of the heart through the lungs into the left, it is plain, that life must be much in danger from a palsy of this kind. All physicians agree, that a spasmodic asthma, returning by fits, is owing to a convulsion of these muscular fibres. May not a continual difficulty of breathing be perhaps owing to a palsy of those fibres? I have seen several asthmatic patients, who expired with great difficulty, and performed inspiration with much more ease. In three dead bodies of persons, who had been affected with an asthma and difficulty of breathing, Ruysch ^f found a cluster of small pellucid vesicles expanded with air, and obstructed in such a manner that the air could not be forced out of them without a good deal of compression; neither had the air introduced by the windpipe any correspondence with these expanded little vesicles: but when they were pricked with a needle they subsided, the air being thereby let out. It seems probable, that these fibres, being rendered inactive, could not expel the inspired air; and that the smaller branches of the aspera arteria which went to those vesicles, being obstructed, and as it were crammed, by the viscid mucous humours, with which the lungs in such diseases are commonly loaded, were at last quite stopt up. If such a palsy of those fibres should be produced in the whole lungs, or in a great part of them, it is sufficiently evident, that respiration must thereby be rendered difficult; nay, and sometimes entirely suppressed.

If therefore a like palsy should happen to those muscles, which in vital respiration dilate the cavity of the thorax, whereby the lungs are suffered to be distended by the air, it appears that death must quickly follow.

And of the gullet.] See what was said concerning

a palsy of the gullet, and the danger of this disease, in the comments to §. 785, 818, where we treated of a Quinsy arising from this cause.

Of the stomach, &c.] It appears from physiology^g, that the stomach not only receives the aliments in the manner of a hollow vessel; but it likewise retains them, presses them by its muscular force, grinds them gently by its vermicular or peristaltic motion, forwards them to the pylorus, and from thence propels them into the duodenum. If therefore these fibres of the stomach become paralytic, all that action ceases; and then the stomach only performs the office of a vessel receiving the aliments, but does not change them by its proper efficacy. The action of the diaphragm and of the abdominal muscles might indeed expel the contents of the paralytic stomach, but then they would pass into the intestines crude and unchanged. But as it receives its nerves from the two trunks of the eighth pair, running by the sides of the œsophagus, thence it appears why a palsy of the stomach is dangerous, if it arises from internal causes, seeing then there is just reason to apprehend that the cause of the palsy is lodged in the brain, near the origin of these nerves.

But a palsy of the stomach likewise frequently arises from the too great flaccidity only of its muscular fibres, although all the nerves, and their origin, remain quite sound. In gluttons, who distend the stomach without bounds, by eating and drinking too plentifully every day, the fibres of that viscus, being so often over-stretched, at last lose their strength, and the action of the stomach languishes ever after. But these muscular fibres of the stomach, while they act, straiten both its orifices, lest the food should escape too suddenly, before it is digested^h: hence, in a palsy of the stomach, the crude and undigested aliments slip over the pylorus not sufficiently straitened, and irritate the intestines, whence gripes and a sudden evacuation of the unconcocted aliments by stool. If at the same time the rest of the viscera are sound, then sometimes a *fames canina* is produced, when the body craves nourishment,

^g H. Boerh. Instit. sect. 83.

^h Ibid.

ishment, but is little or nothing the better for the aliments which are taken in, whence a perpetual craving continues. Ruyfchⁱ discovered such a cause of a canine appetite and lientery in the body of a woman, who had been long troubled with these complaints: for he found all the viscera in very good condition; but the pylorus so relaxed, that he could thrust his whole fingers into it.

Farther, it was said in the comment to §. 1060, that a too plentiful and constant use of hot water may produce a palsy: but the stomach first of all is obliged to feel this bad effect, seeing all hot water taken inwardly is first received into it; whence physicians so frequently observe insuperable languors of the stomach, in those who drink too freely of those hot watery liquors. But these paralytic complaints of the stomach, arising from such causes, though they are very troublesome both to patients and physicians, yet are not so dangerous as if they were produced from internal causes affecting the nerves themselves or their origin.

Intestines.] That these also may be seized with a palsy from the same causes, is sufficiently evident: and then the aliments are soon voided insensibly by the anus, and hardly changed; whereas, in health, the intestines contract themselves so powerfully, that nothing liquid is sent off by stool, although the person drinks very plentifully. The above disease is usually called a Lientery; on which consult what was said in the comment to §. 719, *et seq.*

Bladder.] This has likewise a number of strong muscular fibres, decussating each other variously, by means of which it can expel all the urine from its cavity. If therefore these fibres become paralytic, and the sphincter of the bladder still retains its force, then a retention of the urine must be produced, as happens frequently to those who retain their urine too long. But if the sphincter is at the same time paralytic, the urine escapes involuntarily. Aretæus^k, has very well remarked both these palsies of the bladder. But as the

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ⁱ Observat. Medic. Chirurg. Cent. obs. 74. p. 68.

^k De Causis

et Signis Morbor. Diuturnor. lib. i. cap. 7. p. 34.

bladder receives branches both from the intercostal nerves and the lower mesenteric plexus, as also from the crural; the reason likewise appears, why a palsy of it, produced from an internal cause, is reckoned so dangerous. Hence, in diseases, the involuntary excretion of urine is reckoned a sign of the brain being affected; and therefore is a bad omen, as was observed upon another occasion in the comment to §. 734. But when an incontinence of urine is produced, from a cause lodged in the bladder itself, or its sphincter, it is indeed very troublesome, but not so dangerous as the former.

Of the muscles of the face, bad:] Because the muscles of the face have their nerves from the branches of the fifth pair; and therefore there is fear, lest the cause of this palsy should be lodged in the brain itself, which being increased will easily produce an apoplexy. For if the arm or leg is rendered paralytic, the cause of it may be lodged in the spinal marrow, or in the larger nerves which go out from thence; and therefore topical remedies, applied near the part where the cause of the disease is lodged, may be of service; which cannot happen, if the origin of the disease is in the brain. Practical physicians have frequently observed, that such as are about to fall into a fatal apoplexy begin to have a palsy in the muscles of the face, and likewise of the tongue. They begin to stammer in the time of eating; and, the muscles of the cheeks and lips becoming paralytic, the meat sometimes falls out of their mouth, and soon after they drop down apoplectic. But a palsy of the muscles of the face is hence chiefly distinguished, that, on the side which is not paralytic, the face is contracted, and the angle of the lips is drawn upwards; while the opposite paralytic side appears longer, and as it were pendulous. In general, almost, it may be said, that the higher the palsy is seated in the body, the more dangerous it must be, seeing the cause of the disease must be the nearer the brain. But as the muscles of the eyes are seated almost the highest of the whole body, hence it appears, why Hippocrates has pronounced the worst prognostic (see

§. 734.) in acute diseases, if the eyes are perverted, or the one is rendered less than the other. For as the eye is protuberated without the orbit by the action of the trochlear muscle, upon which the fourth pair of nerves is bestowed; if that muscle should be rendered paralytic, the bulb of the eye will sink deeper as it were into the orbit, and appear less than the other: but this denotes the brain to be affected by the disease, and therefore the worst consequences are to be dreaded. But sometimes the complaint is only topical, without the brain being affected, and then it is happily cured; instances of which I have frequently seen. Often, however, the like numbnesses are at the same time felt in the arm, or hand; and, soon after either an apoplexy, or an hemiplegia, follows. Hippocrates has very wisely remarked this, saying, *But distortions of the face, if they do not communicate with any other part of the body, are presently quieted, either spontaneously or by force: but if the case is otherwise, an apoplexy succeeds*¹.

A paraplegia is very dangerous, &c.] It was said before in the comment to §. 1018, that when the voluntary motions in all the parts below the neck cease, that disease is now commonly called a *paraplegia*. Its cause therefore obstructs the very origin of the medulla spinalis, where it is continued into the medulla oblongata, and therefore is seated very near the brain. Hence, if it is increased, it may produce a fatal apoplexy, because all the actions depending upon the medulla spinalis are thereby abolished. This usually happens, when either the vertebral sheath, or the internal substance of the medulla spinalis, is filled and compressed by extravasated blood or serum, which being gradually increased in its bulk, regurgitates into the cavity of the cranium, and there likewise compresses all its contents. It may also arise from one of the vertebræ of the neck being luxated; and this likewise terminates almost always in death, as was said upon another occasion in the comment to §. 818.

An hemiplegia is bad.] When one half of the body

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¹ Distortiones autem in facie, si nulli alteri parti corporis communicant, cito sedantur, vel sponte, vel per necessitatem; reliqui vero apoplectici fiunt. *Prorrhët. lib. ii. cap. 17. Charter. Tom. VIII. p. 826.*

from head to foot is deprived of all voluntary motion, this is called an *hemiplegia*, as was said in the comment to §. 1018. A paraplegia has frequently appeared, when no fault has existed within the cranium: but perhaps there has never been an instance of an *hemiplegia*, where the brain was not immediately affected; for the patient almost always stammers, finds his memory impaired, &c. And hence likewise it is to be feared, lest, the cause of the *hemiplegia* increasing, a fatal apoplexy should follow. But when a paraplegia, or *hemiplegia*, succeeds an apoplexy, there is more hope; because then we know the cause of the disease is diminished, and that some parts of the brain are relieved from the obstruction.

That which is attended with a coldness, insensibility, &c.] It was remarked at §. 1059, that the cause of the palsy is chiefly two-fold; *viz.* whatever renders a nerve unfit for transmitting the animal spirits; and next, whatever hinders the passage of the arterial blood into a muscle. If therefore there is a coldness in the paralytic part, we know that the circulation of the blood through the arteries of this part, upon which the heat of the body depends, is certainly hindered; and therefore that not only the nerves going to that part are obstructed, but likewise the arteries; and that the disease is so much the more difficult to cure, as the circulation in the part is stopt, or at least so much weakened that it cannot communicate heat to it. We read, in that ingenious essay of Dr Alston^m, upon opium, and its effects in different animals, that amongst the frogs, which he collected for making those experiments, there was one that had the hind-leg paralytic; upon viewing which part with a microscope, he found the red globules of blood entirely dissolved, and the vessels distended with an homogeneous red fluid; whence the blood appears to have remained unmoved in this animal, the muscular fibres of the arteries being rendered paralytic, and therefore incapable of propelling their contained blood. But as it was said before, in the comment to §. 1057, that sometimes, together

gether with the motion, the sense of feeling is likewise entirely lost in the paralytic part, therefore this also is justly reckoned a very bad omen; because the cause of the palsy obstructs the nerves not only of motion, but of feeling, and therefore is very powerful.

But the worst sign of all is, if the paralytic part becomes wasted; for then it denotes, that there is no further supply of nutritious liquid sent to the part affected, and therefore it gradually wastes away in a slow marasmus. This atrophy of the paralytic parts is most commonly observed to happen in that kind of palsy which commonly follows the colic of *Poictou*. I have had frequent occasions of observing and treating this disease, and have with much commiseration beheld the deltoid muscles in both arms to be as it were quite consumed, so that the joint of the shoulder felt as if it was covered only with skin. I have likewise seen that firm muscular flesh, which constitutes the ball of the thumb, and while it acts pulls the thumb forcibly towards the palm, so much wasted, that there hardly appeared the least vestige of it left, and the wretched patients could exercise no force with their hands. But it appears evidently enough, how little hopes of a cure must remain, when the whole bulk of a muscle is wasted by such a marasmus. For the cause of muscular motion may be considered as double, *viz.* either conveyed from some other part to a muscle, or pre-requisite and pre-existing in the muscle itself. The former cause is conveyed by the command of the will through the nerves to the muscles, but in vain, unless the organic fabric of the muscles be good; which being destroyed by such a marasmus, there is nothing to be hoped for, unless the torosity of the muscles can be again restored. But, when such a disease has been of long standing, the vessels being contracted, or sometimes collapsed, their sides grow together in such a manner, that they can never be rendered pervious again to the humours. We see indeed, in consumptive persons, towards the end of the disease, all the muscles are considerably diminished in their bulk, while nevertheless the voluntary motions

remain entire; because that diminution of the bulk depends only upon the fat being consumed, that part of them remaining untouched, to which the cause of muscular motion being applied by the nerves, occasions the muscles to swell. Hence Hippocrates has justly remarked as follows: *If the part affected, besides its want of motion, becomes likewise attenuated, the disease is not to be cured: but if there is no wasting in the part, a cure may be effected*°. To the same purpose we read in Celsus: *But whatever part of the body is rendered paralytic, if, besides its want of motion, it likewise wastes away, it does not recover; and the longer the standing of the disease is, and the older the patient, there is so much the less hope of a recovery*º. For old age itself has a tendency to a marasmus from exsiccatations; and therefore there is no manner of hope, that the parts of the body which are decayed by a marasmus in decrepid old age can ever be restored.

That which is attended with a violent convulsion, &c.] It will appear afterwards in the comment to §. 1064, where the means by which nature cures a palsy will be mentioned, that a palsy is sometimes removed by a violent fever coming upon the back of it, and a convulsive trembling of the part affected. It will likewise appear in the comment to §. 1068, that the chief remedies, which are recommended for the cure of this disease, are such as excite motion, and increase the heat of the body. If therefore those obstructions which produce a palsy cannot be overcome by that powerful action, which, by the unequal distribution of the spirits, manifests itself with so much force on the opposite side, it is obvious enough why in such a case the cure may be foreseen to be difficult.

But from the contrary circumstances, &c.] This is so evident, that it needs no explanation. For thus a palsy

° Quibus una cum hoc quod movere non possunt, morbosa pars corporis attenuatur, hi in sanitatem restitui non possunt: quibus autem colliquationes non accesserint, hi sani evadent. *Prorrh. lib. ii. cap. 17. Charier. Tom. VIII. p. 826.*

º Quacumque vero corporis parte membrum aliquod resolutum est, si neque movetur et emacrescit, in pristinum habitum non revertitur: eoque minus, quo vetustius id vitium est, et quo magis in corpore senili est. *Lib. ii. cap. 8. p. 75.*

palsy descending towards the lower extremities, and leaving the upper parts of the body free, is more easily cured, than if it first attacked the lower extremities, and ascended upwards; for then it usually soon terminates in a fatal apoplexy.

Which is so frequently the cause of a sudden, &c.] Some persons indeed die suddenly; but had preceding symptoms of diseases lurking in the body, pains as it were in the inmost recesses of the thorax, palpitations of the heart, &c. and, upon opening their bodies, there have been found for the most part manifest causes of their death. But sudden deaths have likewise been observed without any antecedent symptoms whatever; neither could any causes be found, upon opening their bodies, to which their sudden fate could justly be attributed. In such a case, it is imagined not without reason, that the heart being rendered paralytic, its motion has been stopt. That seems chiefly to have been the case, when persons have been struck with sudden and violent affections of the mind, an example of which was mentioned a little before in the comment to this aphorism, and of which there are a great many instances in physical authors.

§. 1063. **A**LL which, (1057, to 1063.) if any one applies to each of the muscles destined to different functions of the body, he will understand the causes of an infinite number of diseases, and of a very surprising nature, and will likewise know their diagnosis and prognosis.

Most of the functions in our bodies are performed by muscular motion; hence it easily appears, that they may be disturbed, and entirely abolished, by a palsy. While one whole side of the body is deprived of voluntary muscular motion in the hemiplegia, physicians know, that the cause of it, which is lodged in the brain, is so powerful, as to destroy one half-part of the motions of the nerves which are subject to the will.

will. But if that cause obstructing a certain part of the brain is more gentle, some functions in the body only will be disturbed, the others remaining entire as before. The same thing happens, if any obstruction is occasioned in the nerves, after they have passed out of the medulla oblongata or spinalis, through their whole course to the muscles, in which they are distributed. But though the nerves be found both at their origin and afterwards; yet if the fabric of a muscle is destroyed, or remarkably changed, the functions will likewise be necessarily hurt. Hence it appears, how many and what surprising diseases may be understood from what has hitherto been said of the palsy. A practical example or two will serve to illustrate this still further. If any one considers the wonderful structure of the larynx, and the numerous muscles which regulate the various tension and motion of the cartilages which compose it, and of the orifice of the glottis; if further he reflects, that, in order to form the voice, the pharynx, velum, pendulum, palate, uvula, tongue, lips, &c. must concur, all which parts are moved by muscles; if he knows besides, that, to pronounce a single letter, the action of such a number of muscles is required; he will not be surprised, why all the functions are so often entirely restored, after the cure of an apoplexy, the speech alone frequently remaining hurt; while the patients either stammer as long as they live after, or sometimes are only incapable of pronouncing some letters distinctly; for if an obstruction of this kind should remain in the brain, near the origin of a little nerve which is bestowed upon this or that muscle requisite to speech, that defect in it will remain. The same consequence will likewise follow, supposing the brain to be sound, if an obstruction remains in some of the nerves, which prevents the free commerce between the brain and the muscles. It is very well known, that anatomists, when they dissect living animals, frequently cut off or tie the recurrent nerves, to prevent the disagreeable howlings and noise of these subjects; for the animal, when these
nerves.

nerves are cut, becomes dumb. But Galen^a likewise observed, that the speech was lost in a boy, while a rash surgeon, in cutting out some deep-seated scrophulous tumours in the neck, and, being afraid of an hæmorrhage, did not separate the membranes with a knife, but tore them with his nails, and at the same time unluckily over-stretched the recurrent nerves. There is likewise a surprising enough case mentioned in Wepfer^b, of a woman labouring under a collection of serum in her head, whose speech sometimes gradually failed her, and sometimes entirely left her for ten hours and upwards; but upon coughing up a quantity of thin, crude phlegm, it immediately returned. Nay, which seems still more surprising, if she pressed her head about the lambdoidal suture with her hand at that time, while she was dumb, her speech returned; and the hand being removed, immediately she became dumb again.

We likewise learn from practical observations, that the brain and nerves remaining quite sound, but the muscular fabric being hurt and destroyed, very obstinate and wonderful distempers have been produced. That disease of the Scythians, which Herodotus^c calls feminine *ἑλαιον νόσον*, and was believed to be inflicted upon that nation by the incensed deity because of the temple being spoiled, is ascribed by Hippocrates^d to constant riding; because the most opulent of the Scythians, who spent almost their whole life in riding, were most subject to this disease. For by those perpetual succussions in riding, and the almost uninterrupted compression from the weight of the body upon the parts, the erector muscles were so wasted, that no erection could afterwards be produced. Ruyfch^e has observed, that sometimes, after child-bearing, an incontinence of urine happens for some days, and sometimes even for weeks, occasioned by the too great distention of the vagina from the largeness of the foetus which

^a De Locis Affectis, lib. i. cap. 6. Charter. Tom. VII. p. 396.

^b Observat. Medico-Præticæ de Affectibus Capit. obs. 32. p. 62.

^c Lib. i. cap. 5. p. 44.

^d De aere, locis et aquis, cap. 11. Charter.

Tom. VI. p. 210.

^e Observat. Anatomico-Chirurgicæ. obs. 22. p. 22.

which passes through it, whence the sphincter of the bladder, which is firmly connected to the vagina, is so stretched, that it cannot perform its office. He likewise remarks, that sometimes from the head of the child sticking long in the vagina, or the rude handling of the midwife, a mortification follows, destroying the sphincter of the bladder.

It appears therefore, that from this source the causes and diagnoses of a great many surprising diseases may be collected, as also the prognoses. For when the relaxation of the sphincter of the bladder arose from too great a distension of the vagina, Ruysch very justly expected a cure: but when a mortification had destroyed the structure of the part, there was no cure to be hoped for. Whence likewise the Scythians, taught by repeated observations, laid aside all hopes of regaining their virility, and, clothing themselves like women, performed the offices of that sex.

§. 1064. **N**ATURE has cured this disease by attenuating and dissipating the morbid matter, deposited by an unlucky crisis on the outside of the brain, its ventricles, the medulla oblongata, spinalis, the exit of the nerves from the medulla, and the nerves themselves; by dissolving the obstructing matter by means of a violent fever, by moving it by a convulsive shaking of the part, or by carrying it off by a plentiful and long-continued diarrhœa.

Now follows the cure of the palsy. It has frequently been remarked before, in describing the cures of diseases, that prudent physicians ought to consider with the greatest attention possible, those salutary attempts of nature, by which the most obstinate diseases are sometimes cured; and, these being properly observed and understood, they ought to attempt to imitate by art those things which, happening spontaneously, they observe to be of service. But it appears very obvious, that the cure of the palsy may then be hoped for, when
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the brain, medulla oblongata, spinalis, the nerves, and muscular fibres, remain sound, and the morbid cause has only hindered the free determination of the cause of muscular motion from the brain, through the nerves, to the muscles. Whatever therefore can so attenuate this morbid matter, that it can be dissipated or evacuated; or, after it is attenuated, can change its situation, so as it shall not any longer hinder the action of the brain and nerves, will cure the palsy. Two ounces of glutinous serum lodged in the ventricles of the brain are able to produce the worst complaints; the same quantity of serum, or even a much larger, collected in the cellular membrane of the legs, is easily suffered, without any great mischief. I have several times seen persons who are sleepy, torpid, and forgetful, surprisingly relieved, their feet and legs beginning suddenly to swell: the same relief is frequently observed in practice, to arise from a swelling of the lower extremities, in those who are subject to an asthma. Whence it appears probable, that a palsy may be cured, by the sole metastasis of the morbid matter hindering the functions of the nerves.

But a fever, as was proved before in the comment to §. 587, agitates and moves the stagnating fluids, subdues the resisting obstacles, and frequently expels the morbid matter after it is rendered moveable, and sometimes deposits it in other parts of the body. Whence a fever frequently produces the effect of a medicine with regard to other diseases (see §. 589.) Farther, it appeared in the comment to §. 1017, that an universal palsy of all the voluntary muscles, *viz.* an apoplexy, was cured by a violent fever coming upon it; and therefore in the same manner a palsy might be still more easily removed. The famous Boerhaave saw a taylor who was thrice seized with a palsy, and as often cured by a violent fever coming upon it. There are more instances of this kind mentioned in the comment to §. 1017.

But a convulsive trembling of the paralytic part is good, both as a cause, and as a symptom: for it denotes, that the cause of muscular motion is again applied

plied to the paralytic muscles, but not yet with such constancy, as that its effect can be durable, without soon giving way a little. Whence it indicates a beginning cure, and gives great hopes of its being completed; especially if it is attended with a gentle convulsion. For all the muscles, which have been long at rest, if they happen to be hastily moved, are convulsed; as we see in those who are awaked out of sleep by great noise, or the like, acting suddenly and powerfully upon the common sensory and nerves. But that convulsive trembling is of service likewise as a cause, seeing, by those concussions, whatever remains obstructed in the muscles themselves, in the extremities of the arteries, and perhaps in the very nerves, or at least in their coats, may frequently be resolved. Sometimes there is likewise felt a pricking sensation in the part affected, which is also a good omen. Thus we frequently see, when a person sits nodding, inclined upon one hip, and compresses the great nervous trunk running in the back part of the thigh with almost the whole weight of his body, the leg becomes numb and immoveable: but upon changing the situation of the body, and so removing the compression, in a little time a disagreeable sensation is felt, as if innumerable small needles were pricking the part; soon after which the sense of motion and feeling returns. Wherefore all those symptoms observed in a paralytic part denote, that a free motion is begun in the nerves thro' the arteries to the muscles, and therefore there are great hopes of a perfect cure.

But a plentiful and long-continued diarrhœa carries off the morbid matter, especially if it was an inert phlegm; and it is likewise observed to be of service in an apoplexy, as was said before in the comment to §. 1017. Neither does the observation of Hippocrates contradict this, viz. *Ex diuturno morbo alvi deductio malum*, “A looseness after a lingering disease is bad:” For there that diarrhœa is considered as the worst effect of a long disease, owing its origin to the viscera being decayed, or the intestines rendered quite paralytic;

lytic; as was said upon another occasion in the comment to §. 720: wherefore Hippocrates has said, *ex morbo diuturno*, “from a lingering disease;” and not *in morbo diuturno*, “in a lingering disease.” For he speaks in praise of a copious diarrhoea in such as are subject to white phlegm, *viz.* while this being dissolved is expelled out of the body, as was likewise remarked in the comment to §. 720.

It will appear afterwards, that physicians, imitating nature’s method in curing diseases, have given such remedies as increase the heat and motion in the body, stimulate the nerves, bring on a looseness; and frequently with the greatest success, where the palsy was curable.

§. 1065. **T**HE cure requires, A removal of the cause (1059, 1060) hindering the function of the nerves and arteries; and, A restitution of the free motion of the fluids.

In the comment to §. 1059, the classes of the general causes of a palsy were enumerated; and in that to 1060, the principal particular causes were explained. But the cure of every disease whatever first requires a removing of the cause, and therefore this likewise holds true in curing of the palsy. In the mean time this alone is not sufficient; but it is requisite besides, that a free course of the humours through the arteries and nerves to the muscles, which before was stopt, be again restored. But this last part of the cure is frequently the most difficult, as was remarked before in the comment to §. 1018, where we treated of those complaints which usually remain after the cure of the gentler kind of apoplexy. For then it was observed, that the substance of the nerves was so soft and tender, as frequently to be entirely destroyed by more powerfully compressing causes; or sometimes, also, that these very small vessels, being deprived of any humours passing through them for a long time, were hereby collapsed, and, their sides growing together, they could never be rendered pervious afterwards. I

know very well, from frequent experiments made formerly upon living dogs, that, by tying tight the par vagum of the intercostal nerve in the neck, though the ligature was untied a few minutes after, these animals languished, and died in a few days, because the structure of the nerves was hurt by the tightness of the ligature, and was no longer capable of transmitting the spirits freely to the viscera. This is the reason why judicious physicians have no great hopes of curing a palsy which is of several years standing; because they are justly afraid, that either the structure of the nerves is destroyed, or that their sides are so grown together as no longer to transmit the animal-spirits: hence, in such a case, the motion of the paralytic limbs is sometimes in part restored, but seldom or never entirely, as daily practical observations teach us.

§. 1066. **T**HE obstructing cause is removed by various means, which are easily applied after its nature is considered.

Nothing general can be recommended for removing the cause of the palsy; for according to the variety of it, different remedies are required, as is self-evident. Wherefore the indication of the cure ought to be taken from the history of what happened to the patient before he was seized with the palsy, and from the diagnostic signs which point out the present condition of the body. For if, *e. g.* the shoulder-bone being luxated, and, sticking under the axilla, should press the nerves there in their course to the arm; it would be of no service to apply even the most effectual antiparalytic remedies, unless the bone is first restored to its former situation. But after this has been done, if the free passage through the nerves which were compressed is not yet restored, then stimulating medicines, frictions, &c. will take place.

§. 1067. **I**F that internal cause happens to be thick and stagnant, such remedies ought

ought to be used as are capable of producing those effects by which nature (1064) has frequently cured this disease.

In the cure now to be described, we do not treat of the palsy which is owing to the menstrua or hæmorrhoids being detained, or to plethoric or inflammatory tumours: for in such a kind of palsy the same cure is required which was described, in the comment to §. 1030, for the apoplexy arising from the same causes; or is brought about by promoting the usual evacuations, which are now suppressed. But here we treat of a chronical disease, whose cause is thicker and stagnating; and in such a case, art attempts to imitate those endeavours of nature by which it appears that a palsy has been cured. But these are, An increase of motion, occasioned by a strong fever; a convulsive concussion of the part affected; or a sudden resolution of the humours, and sending them off by stool. If now we examine all the remedies which have been recommended by the most skilful physicians for the cure of this disease, it will appear that they may be reduced to these three classes. Whence again we learn, that physic is never of greater service to mankind, than when it can follow the footsteps of nature in the cure of diseases. But of the remedies from which this is to be expected, we shall treat in the following aphorism.

§. 1068. **W**HEREFORE the cure is to be attempted, I. By attenuating and dissipating medicines; 1. By aromatic, cephalic, nervous, and uterine vegetables, as they are called, in the form of expressed juice, infusion, decoction, extract, spirit, or conserve. 2. By fixed salts prepared from the same vegetables by burning, or volatile salts by distillation or putrefaction. 3. By oils produced from the same by expression, boiling, infusion, and distillation. 4. By saponaceous remedies, produced from an artificial

composition of the above. 5. By the strong-smelling parts of animals, the juices, spirits, oils, salt, and tinctures of insects. 6. Fossile salts, metallic crystals, and medicines composed chiefly of these. 7. By a judicious mixture of all these, whereby they help each other : and by the use of them is produced attenuation, dissipation, and a feverish heat. II. By powerful stimulants, and such remedies as act strongly upon the obstructed matter, by raising a trembling and convulsive motion of the nerves ; to which class chiefly belong sternutatories and strong vomits, especially if they are several times repeated. III. By hot, resolvent, aromatic, vegetable, and likewise acrid fossile, and metallic mercurial, antimonial, and therefore strong hydragogue purges, in large doses, and repeated several days successively ; by means of which a plentiful and lasting diarrhoea may be produced. IV. By first filling the vessels, by drinking largely of the above attenuants ; and afterwards increasing the motion, and exciting a sweat by steams of burning spirits.

I. To this purpose we recommended all those remedies which attenuate the thickened liquids, and put in motion and dissipate those which stagnate.

1. All plants, and the different parts of them in which their fragrant odour and hot penetrating taste reside, are commended for this purpose ; hence these have been called, time out of mind, Cephalic, Nervous, and Uterine remedies. The use of those was explained before in the comment to §. 75, where we treated of the cure of a Spontaneous Gluten : and in the *Materia Medica* to the fifth number of §. 75, there is set down a list of leaves, flowers, roots, and seeds, in which there is both a fragrant odour, and an acrid, heating, aromatic taste ; at the same time proper formulæ are there prescribed, and how these remedies may be variously

riously prepared and exhibited. In the expressed juices there is both that stimulating aromatic part of those plants, and that resolvent saponaceous quality which is found more or less in all fresh-expressed vegetable juices. The infusions contain whatever can be dissolved in water which is almost boiling, long digested in close vessels with those aromatics; and therefore have likewise a very good effect. But the decoctions are generally deprived of the most fragrant and volatile part of the aromatic plants, unless they are boiled in very close vessels, and for a very short time: For the same reason most extracts (which are only inspissated decoctions,) prepared of the fragrant parts of vegetables, have less efficacy, and contain only the more fixed parts of those medicines. It would certainly be in vain for any one to expect the virtues of scurvy grass, water-cresses, horse-radish, and the like, from extracts of the inspissated juices of those plants, seeing their acrid stimulating particles are so volatile: nay, in general, all extracts, prepared from those parts of vegetables which by distillation yield a fragrant and aromatic water, are less efficacious. It is very true, that such extracts may be afterwards diluted in the distilled waters of the plants, and so have that volatile fragrant restored to them which they had lost; but thus that will be obtained with greater labour, which an infusion prepared in close vessels, or the juice of the plants fresh expressed, could readily afford. Of these aromatics are prepared volatile spirits, in which the volatile part alone of those medicines resides; but not the saponaceous fixed part, endowed with a resolving quality: and therefore they only act by stimulating and heating. Formulæ of this sort you may see in the *Materia Medica* at the place above quoted; and several of the same kind are to be found in all the shops, under the title of anti-apoplectic waters, anti-paralytic waters, &c. It is likewise a very good method, to exhibit these aromatics in substance (as they call it), *viz.* to give them powdered, and made up in the form of a conserve or electuary with some common aromatic syrup, ordering a drachm or

two to be taken every three or four hours. The same intention is answered, if the recent and succulent herbs, flowers, roots, &c. are beat into a pulp, adding an equal quantity of the driest sugar, in order to preserve them; whence such medicines are called conserves in the shops, and are used in the same manner as the others. But these are chiefly efficacious, if they are used fresh; for when they are kept long in the shops, they lose a great part of their fragrancy. While these remain in the stomach, they are gradually dissolved by the humours which are sent there; and the use of them being repeated several times a-day, they stimulate, heat, and quicken the motion of the humours with a gentle and continual action. Formulæ of this kind likewise may be seen in the *Materia Medica* at the same place, according to the forms of which several others may be compounded.

2. Concerning the attenuating and resolvent power of those salts we treated before, §. 135. in the cure of an Obstruction. From the most part of plants, burnt to ashes, an alkaline fixed salt may be got, by making a lixive in water, which salt powerfully attenuates the thick and glutinous parts of the blood. But as in the cure of the palsy those are chiefly commended which, together with a resolving power, possess a stimulating acrid force, and, being naturally very moveable, are dispersed every where with the heat of the body; hence volatile salts are usually preferred to the fixt for this purpose. Several of the acrid antiscorbutic plants are impregnated with such a salt, which, exhaling upon their being only gently broken or bruised, stimulate the nose with a pungent acrimony, as is observed in scurvy-grass, water-crelles, mustard, garlic, and onions: these plants afford a salt of this kind even in a dry form, or, being distilled with wine or its spirit, they yield those acrid spirits, commonly called *antiscorbutic*, in which a volatile salt of this kind is contained in great plenty. The same kind of volatile alkaline salt may be obtained by distillation from the other plants, after they have been putrefied; even the very acid wood-sorrel not excepted. Besides, all the parts

parts of animals, even without any preceding putrefaction, afford the same sort of salts in distillation. Such is the salt of hartshorn, ivory, &c. and also what is called the *spirit* of hartshorn, ivory, raw silk, &c. which are nothing else but an alkaline volatile salt, diluted in a watery phlegm which arises with it in distillation. These salts diluted in aromatic distilled waters, and given in frequent doses, are of great service both for resolving and stimulating.

3. That delightful fragrancy, observed in a great many aromatic plants, which is naturally very volatile, is inviscated in an oil, so as to hinder it from flying immediately off: whence those oils, being separated chemically from the plants, contain in a small bulk that aromatic quality, as appears in the oil of cinnamon, cloves, origanum, rosemary, &c. for several of these aromatic distilled oils are to be had in the shops. In some aromatics, that oil is lodged separate from the other parts in little cavities proper for it, and may be forced out of them by gentle pressure; as appears in the fresh rinds of lemons and oranges, from which, when they are squeezed even gently between the fingers, a fragrant oil spurts out; and thus may be collected pure, without having suffered the fire. Nutmegs, and that wonderful net-work adhering to the external surface of the nutmeg, which is sold in the shops by the name of mace, being bruised in a mortar, and then squeezed in a press, yield a great quantity of a fragrant oil, of the consistence of butter. Fresh bayberries bruised, and gently boiled in a large quantity of water, yield a green aromatic oil swimming upon the water, which when it is cool, likewise thickens, but however is softer than the expressed oil of nutmegs. All these are of very great service in this disease, both externally and internally. There are sold likewise in the shops oils prepared by infusion from the aromatic herbs and expressed smooth oils, of olives, almonds, &c. but the most part of these possess only in a small degree the quality of the infused aromatics, and therefore the former are preferred to them.

4. Oil united to salt in such a manner, as that they both

both together can be equably diluted in water, is called *soap*. Of the different kinds of soap, and their great efficacy in resolving obstructions, we spoke before in the comment to §. 135, n^o 3. But as, in the cure of the palsy, together with an attenuating, there is required a stimulating and heating force; hence those soaps, prepared chemically of aromatic fragrant oils and alkaline salts, are preferable to the others. Thus that soap, called *Starkey's*, which is made of a fixed alkaline salt and the fragrant etherial oil of turpentine, is justly commended. But above all, the volatile oily salts, as they are called in the shops, which are prepared from a volatile alkaline salt, rectified spirit of wine, and aromatics, or their distilled oils, and are sold in all the shops, are extremely useful. A formula of such a volatile oily salt you will find in the *Materia Medica*, §. 75, n^o 5.

5. Those bodies, which send forth a strong fetid smell, the Latins called *viroſa* (rank): we have such in the *Materia Medica*, which are either the parts of animals, or animal-juices. Castor, which Virgil calls rank, musk, and civet, heat, excite, and quicken the motion of the fluids, and by this means are very serviceable: but castor is more commonly given than the others, because musk and civet diffuse such a very strong smell, that they have frequently occasioned great uneasiness to hysteric and hypochondriac persons; and therefore if they are not hurtful to the patients, they are at least often so to those who are about them. Aëtius^a, who collected such remedies as were praised by the ancient physicians for the cure of the palsy, commends castor mixed with an equal quantity of opopanax and sagapenum. Besides, there are some insects used in physic, which abound with an alkaline volatile salt, and being powdered yield that smell; which are of service both by their resolving and stimulating quality. The expressed juice of millipedes fresh-gathered and bruised with some aromatic water, the powder of them dried, as likewise of cochineal and of kermes (which likewise belong to the insect

^a Lib. vi. cap. 28. p. 109.

insect tribe,) have been found an effectual remedy by later physicians. Cantharides have a much more acrid stimulus, and a more efficacious resolving force: but they ought to be used internally very rarely, and with the greatest caution, seeing they frequently produce the very worst and most dangerous symptoms; and therefore they were condemned by the ancients as poisonous.

From these, by the help of chemistry, may be obtained sufficiently acrid volatile alkaline salts, and fetid oils, serving both for internal and external use in the cure of this disease, as the oil of hartshorn, of human blood, &c. Whence, again, may be had great variety of efficacious remedies.

6. It was observed before in the comment to §. 135. no 1. how great a power of attenuating and resolving salts are possessed of. The same being exhibited in a greater quantity stimulate remarkably. But when metals, dissolved in their proper menstrua, are reduced to crystals in the form of a salt, they suffer themselves to be diluted with water, and may be very equally distributed over the whole body; and thus are had the most effectual remedies, by which the chemists have so often performed amazing cures in the most obstinate chronical diseases. When these metallic salts are diluted in a small quantity of water, they irritate the stomach and intestines, and so vomit or purge: but when they are diluted in a large quantity, they pass through the primæ viæ without much irritation; and being taken up by the absorbent veins of the intestines are mixed with the blood, and, circulating with it through the whole body, open the most obstinate obstructions. In many mineral waters dissolved iron is contained; and for a great many ages physicians have cried up the salutary effects of those waters. For all the remedies, which are gathered from the animal or vegetable tribe, although they are certainly possessed of a considerable medicinal force, yet they seem to be sooner changed by the powers of our body than those which are taken from the fossile kingdom. From the ashes of the bones of animals, as likewise from
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those of vegetables, nay from honey itself when it is burnt to a cinder, iron is extracted by the help of the loadstone; whence it is justly concluded, that, being divided into particles inconceivably small, it may pass through the vessels of animals and vegetables, and nevertheless maintain its former quality, not being changed into the vegetable or animal nature, and therefore to have constantly preserved its force. Hence it appears, what good may be expected from metallic salts, diluted in a great quantity of water, so that they may not by their acrimony irritate the stomach and intestines, but may penetrate the inmost recesses of the body. Besides, it is to be considered, that from the union of the metal with the solvent menstruum new powers arise, which did not pre-exist, neither in the metal alone, nor in the menstruum, but are only observed to arise after these are united. Insipid silver, dissolved in spirit of nitre, affords very bitter crystals; from which is prepared that lunar purgant of Boyle, which frequently carries off the waters in hydropic persons with so much success: now that purging quality was neither in the silver, nor in the spirit of nitre, but is in the composition formed of both these united together. It is very well known, that several ounces of quicksilver have sometimes been taken without any bad effect; and likewise that the spirit of salt diluted with water may easily be suffered by the human body: but these two united together make the corrosive sublimate, of which a few grains are sufficient to kill the strongest man. However, that same corrosive sublimate, while it is given in small quantities very much diluted, frequently produces surprising effects in curing diseases, and by some is concealed as a secret: concerning which we shall say more elsewhere.

So likewise we have salts compounded in the shops, which are endowed with a wonderful resolvent quality, and yet nevertheless are suffered without any trouble by the body, although they are given in pretty large doses; as tartarised tartar, regenerated tartar, and the neutral salt produced from a mixture of spirit of vinegar with an alkaline volatile salt, as likewise
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from a mixture of volatile salt of hartshorn with the acid salt of amber, &c. all which may be of service for this purpose.

7. Thus the different classes of efficacious remedies are enumerated: but several of these may likewise be compounded together with judgment, so as by their united force they may perfect a cure so much the more quickly and effectually. Thus I have seen a remarkably good effect (after swallowing for some days pills of aloes, sagapenum, myrrh, and galbanum, and so having cleansed the primæviæ) from a drachm of salt of hartshorn, given early in bed, in some ounces of distilled lavender water, or some other of the same nature; drinking after it an aromatic infusion of saffiafras wood, rue, rosemary, or the like; and at the same time rubbing the part affected: of which we shall speak more at large in the following aphorism. But the use of this remedy was frequently repeated, because that obstinate disease very seldom or never can be soon cured.

At the same time a warm dry air is of service; whence a fervid summer is beneficial to paralytic persons: and such a temperature may be communicated to the air by art in cold seasons; or it may be obtained by travelling to dry, hot, and mountainous countries. Roasted meat, especially venison of all kinds, and wild fowl; hot sauces from mustard, garlic, onions, origanum, savory, &c.; smooth, but generous wine; ale, strong, but not hard, such as Brunswick mum especially, which I have seen frequently of very great service. By all these a heat and thirst will be excited even in a man of a cold constitution; and such a diet (§. 586.) was reckoned amongst the causes of a fever. But nature has cured the palsy by bringing on a strong fever, as was said at §. 1064: and the intention of art is to imitate nature in curing of this disease; and therefore to produce attenuation, resolution, and a feverish heat.

II. By powerful stimulants, &c.] Most part of the remedies, which were commended in the preceding number, besides their dissolving quality, act likewise

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by stimulating; whereby the circulation is increased, and a greater heat is produced in the body. But here we treat of another species of stimulants, which often, without any acrimony discoverable by the senses, in a surprising manner disturb the whole body, acting especially upon the nervous system, and agitating by violent convulsive motions all the parts of the body; with this intention, that whatever obstructs the free passage of the nervous spirits into the paralytic muscles may be expelled. For after, by resolvent medicines exhibited for some time, and by the increased heat and motion of the circulating humours, all the fluids are more disposed to pass through the vascular system, then sudden and violent concussions produce a surprising effect in this disease.

Such concussions are excited by sternutatory remedies; for in sneezing there is no part of the body which is not shaken, and almost no muscle that is not brought into action: frequently, even the paralytic limbs have been observed to start in the time of sneezing, and thus begin to recover their motion; hence it may justly be expected that the motion in paralytic parts should be increased by repeated sneezing. For by this means will be obtained, what Celsus advises to be attempted by another method, but perhaps less efficacious: for if the motion is hindered by weakness, he says, *Let the patient either be carried, or shook by the motion of the bed: likewise the member which is diseased, must be moved of itself if possible, if not by some other means, and be forced as it were to return to its natural motion*^b. But whatever irritates the nerves, dispersed upon the internal surface of the nostrils, is able to produce sneezing: thus tickling the nostrils with a feather will have this effect. Besides, there are remedies called *errhine* or *sternutatory*, which being snuffed up the nostrils stimulate, and produce sneezing, sometimes very violently. The more mild kinds are composed of fragrant and aromatic herbs; either recent, and twisted in the form

^b Vel gestetur, vel motu lecti concutiat: tum id membrum, quod deficit, si potest, per se, sin minus, per alium, moveatur, et vi quadam ad suam consuetudinem redeat. *Lib. v. cap. 27. p. 179.*

form of a tent, and thrust up the nostrils; or dried, and reduced to a powder. The more acrid kind are tobacco, to those who are not used to it; the seeds of gith, and the roots of hellebore, euphorbium, &c. which last ought to be used with caution, because sometimes by their caustic quality they ulcerate the membranes of the nostrils, and occasion a sneezing which is hardly to be stopped, and threatens convulsions. But the too violent sneezing occasioned by acrid sternutatory medicines is usually appeased by snuffing new milk alone up the nostrils, or the same boiled with marsh-mallows, or the like emollients.

For the same reason vomits are commended, and those of the strongest kind: which are useful not so much by evacuating, as by moving and shaking the whole body, and producing a convulsion of the greatest part of the muscles; as was said before in the comment to §. 652. For, by this method, art attempts to imitate that which nature effects by a convulsive trembling of the paralytic part (see §. 1064.) Celsus^c says, that in paralytic persons a vomit after supper is of service; but he seems there to have only meant a gentle vomit, which might be excited by warm water alone, or a little salt and honey mixed with it: which vomit was reckoned among the diætic remedies of the ancients, as appears from another passage^d of Celsus. But here much stronger vomits are requisite; and especially antimonial, which usually disturb the body much more, and produce more troublesome sickness and strainings, than the milder ones taken from the vegetable kingdom.

But it appears very obvious, that those violent concussions by vomits and sternutatories ought not to be used, unless the viscera are sound; the patient sufficiently strong; and no fear of an apoplexy from a plenitude of the vessels, which might be broken in the brain in the time of vomiting or sneezing, as was observed upon another occasion in the comment to §. 1026.

May not the same intention be answered by that sur-

prising concussion, which is excited by the electric force applied to paralytic parts? It is certain, that it penetrates every thing, as it were, with a thundering force and celerity: and as philosophers who have studied these surprising phenomena have found out methods by which the intenseness of this electric force may be very much increased, such violent concussions may be produced in the bodies of animals as frequently to make these experiments dangerous. I have seen small birds killed by an electric stroke, and in them I observed an evident fugillation under the cranium in the dura and pia mater. But this ought likewise to be tried with great caution; and it certainly deserves to be put to the trial, seeing there is no method hitherto known by which so quick and powerful a motion can be excited in the various parts of our bodies. But in the mean time we ought to take care, lest such a motion should destroy the nerves, which it is intended to cure; or perhaps produce mischief in parts which are sound. I once saw a strong man, who upon touching an iron rod, which was strongly electrified, with the fore-finger of his right-hand, felt such a violent shock in his left knee, that he would have fallen down with the sharpness of the pain, if the persons who were by had not supported him; and he was sensible of the disagreeable remains of pain in that part for several days after; neither could he be prevailed upon by any reward or intreaties to try the electric force again, which before he had despised thro' ignorance. There have been a great many electrical experiments made by very ingenious men, which demonstrate its great efficacy; but at the same time shew that it is dangerous, if those experiments are not prudently set about, to relate which would be foreign to the present purpose. But it appears from plain and certain experiments, that much service might be expected thence in the cure of the palsy: for the electric fire can be extracted at pleasure from any muscle, and from different parts of the same muscle; and while this is done, the muscles are agitated with a convulsive motion, which is here required. These concussions may be repeated as often

as we please, and likewise rendered more or less intense. But as arguments a priori are usually less convincing to physicians, successful effects of electrical experiments in curing this disease are of greater weight. I shall only relate one mentioned by the famous Jallabert^e, a professor and great improver of experimental philosophy, who tried the electric force with happy success upon a man whose right arm had been paralytic for fourteen years. But it is to be remarked, that it was such a palsy, as could hardly be hoped to be cured by any other remedies: for the long standing of the disease, the cure of which had been attempted in vain by other remedies; the insensibility of the part affected; its livid colour, and wasting (see §. 1062.) afforded a very unfavourable prognosis. But in this very disease, after ten days, the sense of feeling returned to the part, which increased in its bulk, and was restored to its natural colour; and, by the continued use of electrifying, the muscles, which before were paralytic, gradually recovered their strength. This cure is sufficient, to prompt us to try the efficacy of electricity in the palsy: but likewise from some phenomena which happened to this patient when he was strongly electrified (the philosophers call it a *commotion*, because the whole body is violently shaken by this experiment), physicians who make use of this cure with their patients may learn to act cautiously^f; and likewise philosophers beware of exposing themselves rashly to such dangers, as the strongest degree of electricity produces, after the manner of thunder. Jallabert was desirous to effect a cure as quick as possible; but he learnt at the risk of the bye-standers, and to the no small detriment of the patient himself, that in such cases we should not be in too great a hurry.

Neither is it any objection, that all paralytic patients cannot be cured by this method; for physicians have always regretted, that frequently a palsy will not yield to any remedies: it is sufficient, that, in paralytic limbs, that surprising agitation, produced by the electric force, has been found to be of service, to incite

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^e Experiences sur l'Electricite, &c. p. 143, et seq.

^f Ibid. p. 128.

us to try it with proper caution for the future. But as the electric force, in its most intense degree, has a great many properties in common with the stupendous energy of thunder, it may be inquired, whether a palsy might not be cured by thunder itself, acting by a somewhat similar, but a much stronger efficacy? Diemerbroeck^g mentions a surprising case of this kind, which he saw himself. A woman, who had been seized, when she was six years of age, with a palsy of the whole body, excepting only the head, from a sudden fright, and afterwards had her lower extremities paralytic for thirty-eight years, was suddenly cured of this disease, while in a terrible storm the lightning shone frightfully all round her. This author affirms, that she was exposed to public view after she was cured, that he had visited her a thousand times while she was paralytic, and saw her in health fifteen years afterwards. It is very true indeed, that that wonderful and sudden cure might be ascribed to the great fright; but the disease had been occasioned by a fright several years before. In the mean while, medical history affords us several such observations, from which it appears, that a palsy has been cured by sudden anger, or a great fright. Thus a person in a violent passion, endeavouring to beat his servant with a stick, was immediately cured of a contraction of the ham, of a long standing, which had quite hindered his walking. Another, who had been hemiplectic for several years, and tried all the remedies that could be thought of to no purpose, was restored to the use of his limbs, by a fire happening in the house where he lay, whence he threw himself down, and afterwards continued free from this disease^h. The son of Cræsus, who was dumb, on seeing a Persian soldier rushing upon his father, called out immediately, *O homo, ne perimas Cræsum*; "O man, do not kill Cræsus;" and afterwards had the use of his speech as long as he livedⁱ. All these examples evidently teach us, that violent and sudden frights sometimes restore motion to paralytic parts, and therefore

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^g Observ. et Curat. Med. obs. 10. p. 9.
Med. lib. i. de Paralyfi, p. 94.

^h Schenk. Observat.
ⁱ Herodot. lib. i. cap. 85. p. 35.

that these may likewise be tried: but, however, the event must always be doubtful; seeing a great many other observations inform us, that from the same causes a palsy, and a great many complaints besides, as also sudden death, have been produced.

III. By purgatives, &c.] This is another artificial imitation of that method whereby nature has sometimes cured a palsy, *viz.* by a plentiful and long-continued diarrhœa. We have in physic medicines which produce this effect; and such are made choice of, as, together with a purgative quality, heat, quicken, excite, and dissolve the humours of the body. Aloes, scammony, colloquintida, gutta-gamba, jalap; &c. are endowed with this quality: for these being frequently exhibited, besides purging strongly, so dissolve the entire mass of blood, that the whole body becomes pale, although there is not a drop of blood voided by stool; and therefore that paleness is owing entirely to the red blood being dissolved. There are likewise several officinal compositions prepared from these; *viz.* *Extractum catholicum*, *panchymagogum*, *pilula cochie*, as they are called, and several others of the same kind; to which if we add efficacious, but safe, mercurial preparations, as sweet mercury, white precipitate, and turbith mineral, this indication of cure will be most thoroughly answered. But all these, as they carry off the dissolved humours by stool in the form of a thin water, are therefore called *hydragogues*. In the mean time, it ought always to be considered, whether the patient is strong enough to bear those powerful remedies, and whether the viscera are perfectly sound. But although a diarrhœa produced in this manner, and continued for some days, may be of great service; yet if it appears not quite so safe to continue so sudden a colliquation and evacuation of the humours for several days running, one of the above purges may be given now and then, and in the days free from purging those remedies may be used which were recommended in the comment to the first number of this section; of which method I have frequently seen very good effects.

IV.] Concerning this method we treated before in

the comment to §. 529, when we were upon the cure of diseases of the bones : and then it appeared, that the corrupted medullary oil, lodged in the inmost recesses of the bones, might thus be washed out, whereby limbs have been preserved, which almost every body had condemned to be amputated. The decoction of guaiacum was then chiefly recommended as an attenuating antiseptic remedy, which may likewise be used in this case. In the mean time, the vessels may be filled for some days with those remedies which are recommended in the comment to the first number of this aphorism, diluted with plenty of water, and the patient afterwards sweated with the vapour of burning spirit of wine: for by this means a great heat, and quicker motion, is communicated to the humours, which were diluted and attenuated; and these two circumstances joined together seem the fittest for removing those obstacles which hinder the free motion of the nervous spirits through the paralytic limbs, especially if the vapour of the burning spirit of wine be so determined as to be applied to the seat of the cause, (concerning which we shall treat in the comment to §. 1070). Wepfer * frequently used this method with success in curing a palsy, and other diseases of the nerves, as appears from his observations.

§. 1069. **D**RY, warm, external frictions, till the parts become red, either with penetrating and stimulating spirits prepared from animals and vegetables, or with nervous oils, liniments, balsams, and ointments, are of service here; with vapour-baths, and hot baths; acrid, aromatic, and attrahent plasters, as they are called; cupping, scarifications, blisters, whipping; and such things as excite pains, and gentle inflammation, as nettles, and the like, are useful.

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* Observat. Medic. Practic. obs. 32. p. 72. et aliis pluribus locis.

What service may be expected from friction in a great many diseases, was explained before in the comment to §. 28, no 2. For the motion of the blood is thereby accelerated in the part, and afterwards by the continued strong friction the same motion is increased through the whole body; and as the part rubbed begins to grow red, swelled, and heated, it is plain that the humours must flow through it in greater quantity and with more force. But friction likewise affects the nerves dispersed through the parts, and may move and resolve those humours which stick in the vessels running upon their coats, whereby palsies are frequently produced. Hence Celsus has justly said: *Membrum aliquod resolutum, ipsius frictione confirmatur*: “ If a
 “ limb becomes paralytic, it is strengthened by friction^a.” But as sometimes paralytic members become wasted, and lose their torosity, friction will be of service *ad alendum id quod tenue et infirmum est*, “ to
 “ nourish that part which is decayed and weak^b.” But by friction an electric quality is likewise excited: at least this has been observed in some animals; in cats, for example: May not the same be of service from this cause likewise? Now these frictions are applied to the head, throat, below the orbits of the eyes, to the sides of the chin, and behind the ears; but especially to the hind part of the neck, and the whole spine, arm-pits, groins, and hams; in all which places there are remarkable nerves placed near the teguments. But the parts to which the friction is applied are various, according to the different seat of the cause of the palsy, as will be said in the following aphorisms. As in the palsy there is observed a laxity of the muscles (see §. 1057,) hence the woollen cloths, made use of in rubbing, are usually imbued with a strengthening aromatic vapour; a formula of a proper fumigation of this kind you may see in the *Materia Medica* for this number. For the same reason paralytic parts are rubbed with spirituous liquors, which stimulate and strengthen at the same time: a formula of this kind you may likewise see in the same place;
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^a Lib. ii. cap. 14. p. 89.^b Ibid. p. 88.

and all the aromatic spirits, both simple and compound, which are sold in the shops, may serve for the same use. It is usual likewise, after a strong and continued friction, to anoint the paralytic parts with aromatic ointments, commonly called *nervine* in the shops; a formula of which you may also see in the same place. But in the mean time these last, as they are composed of fat oily medicines, will perhaps relax the parts which are already too flaccid; hence the spirituous medicines, and aromatic steams, appear to be preferable: though the ointments too have their use, if they are properly applied. For it is usual in paralytic limbs for the flexor muscles, which are always stronger than the extensors, by their proper contractility to be rendered shorter, and retain the joints in a perpetual state of flexion, while at the same time the ligaments of the joints become stiff for want of exercise: wherefore such ointments will be of service after friction, if they are rubbed upon the flexor muscles, and the joints; while at the same time the laxity of the extensors, which have been long overstretched by the prevailing action of the flexors, is corrected by spirituous and aromatic vapours. For it was demonstrated before in the comment to §. 25, n^o 3. that a too great and long-continued distension weakens the solid fibres. The proper method is, to repeat those frictions twice a-day; and in the intermediate space to cover the part with a warm aromatic plaster, that so it may be continually cherished, kept warm, and stimulated. There are likewise formula's of this kind of plaster in the *Materia Medica* for this number: but why those plasters are called *attrahents*, appears from what was said in the comment to §. 134, where we treated of those remedies.

Vapour-baths, hot baths.] As nothing relaxes the solid fibres of the body more than hot water, especially the steam which arises from it; and as these relaxing remedies seem not so well to agree with the flaccid and paralytic parts; hence those dry heats will rather be of service,---*et arenae calidae, et laconici, et olibani, et quarundam naturalium sudationum, ubi a terra profusus*

fusus calidus vapor ædificio includitur; “both hot sand, “a stove, common fire, and some natural baths, “where a hot steam evaporating from the earth is “confined in a house built for the purpose,”---which Celsus^c commends: And afterwards he adds, that some diseases of the nerves may be thus effectually cured, *quando nempe humor intus nocet, isque digerendus est*; viz. “when the humour contained in them is “hurtful, and ought to be digested.” Baccius^d mentions several such places, where these dry baths are to be met with. For the same reason hot baths are not always of service in the cure of the palsy; and only in that case, where the impediment, hindering the free influx of the spirits and arterial blood into the muscles, can be softened, and resolved by baths; or when anchyloses, arising from a long want of motion of the paralytic parts, require bathing, that a due flexibility may be restored to the rigid fibres. For in that case, where the cure of a palsy requires acrid stimulants, an increase of motion in the part affected, or in the whole body, and a strengthening of the flaccid parts, moist baths, both vaporous, and immerfive, seem to be less useful. But when medicinal hot baths, rushing forcibly or falling from on high on the paralytic parts, move and shake it strongly, then they are frequently of great service. Cases of this kind the celebrated Cocchi^e has related. But Cœlius Aurelianus^f, in the cure of the palsy, says: “The parts affected ought to be placed under the falls of water, “which the Greeks call *κατακλυσμους* (*cascades*;) for “their percussions produce a great change upon the “bodies exposed to them:” Where he ingeniously ascribes the effect of the cascade to the percussion.

But the cold bath is commended by some for the cure of the palsy: and certainly if the effects of cold water, applied suddenly to the body, are considered, one might hope for success sometimes from this method likewise. For there follows a shuddering and
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^c Lib. ii. cap. 17. p. 93.

^e Dei Bagni Di Pisa, cap. 4. p. 197.

p. 361.

^d De Thermis lib. iv. p. 118.

^f Morbor. Chronic. lib. ii.

concussion of the whole body from the application of very cold water : afterwards there is produced a heat, and redness ; the pulse is rendered stronger, and quicker ; and if the person goes to bed immediately after bathing in cold water, there for the most part follows a profuse sweat. Thus by art a fever is communicated to the body, beginning with shuddering and coldness, and afterwards followed by heat and sweat : now, a fever, and a convulsive motion of the parts, were reckoned (§. 1064.) amongst those helps which nature commonly uses for the cure of this disease. Farther, it was remarked in the comment to the above aphorism, that it was a good sign, if a kind of troublesome pricking, and creeping sensation, was felt in the part affected : but if a person washes his hands in very cold water, or in snow, he will have such a sensation. Neither are there wanting a great many observations, which teach us, that after several remedies have been unsuccessfully tried, and even hot baths themselves, palsies have been cured by means of cold bathing, and especially if the part affected was exposed to a cataract falling from a high place ^g. Cœlius Aurelianus ^h recommends swimming in the sea in this case ; advising, *partibus passione vitiatis adjungendas esse vesicas, quo natandi laborem minuant* ; “ bladders to be fixed to the paralytic parts, whereby the “ fatigue of swimming may be lessened.” But this kind of swimming has the same effect as the cold bath. The safest method of using the cold bath seems to be, by dipping the patient all over at once, and bringing him out again immediately, lest the unusual cold should penetrate too far into the internal parts ; and this immersion should be frequently repeated, after which he ought to be laid in a warm bed. Thus by degrees, the body being inured to the cold, he will be able to bear both a longer stay in the cold bath, and a more frequent immersion, without suffering from it.

Acrid plasters, &c.] Of those plasters we treated a little while ago. We may see, that physicians in all ages have applied such plasters to paralytic parts, as might.

^g Floyer *ψυχρολουσία*, p. 212, 456.

^h Loco modo citato.

might increase the motion and heat, and occasion a slight inflammation. Thus Trallianⁱ generally commends the more acrid sort, *quæ emortuum sensum revocare possunt*, “ which are capable of recalling the “ feeling which was almost lost in the part;” and praises liniments prepared from pepper, euphorbium, castor, &c. Celsus^k orders, *torpentis membri summam cutim exasperare, vel urticis casam, vel imposito sinapi, sic ut, ubi rubere cœperit corpus, hæc removeantur*: “ to fret the skin of the paralytic member, or “ to whip it with nettles, or apply mustard-seed to “ it, removing it as soon as the skin begins to grow “ red.” Farther, he recommends pulling the skin for a great while, every third day, with rosin applied in the form of a plaster to the part affected. Those sticking plasters composed of pitch, rosin, colophony, and the like, are usually now called *depilatories*: which if they are applied to a part of the body that is well cleaned, so that no moisture nor greasiness remains upon it, they lie very close, and, if they are suddenly pulled off, inflame the skin, and produce a troublesome pain. So likewise by means of cupping-glasses an inflammation may be raised in any part of the body; and if a scarification is made at the same time, then the matter lodged in the distended vessels is prevented from becoming hurtful by stagnating. You may see what was said upon these, as well as upon blistering plasters, in the comment to §. 1025, concerning the cure of the Apoplexy.

Farther, it was said in the comment to §. 1062, that a wasting of the paralytic part was the worst kind of omen. But all these, by irritating the part affected, by rendering it red, and increasing the heat of it, distend and fill the vessels which were too rigid or collapsed; and thus prevent the atrophy of the part, or cure it after it has been produced. Whence Galen made use of pricking, for restoring parts which were seized with the atrophy: *Si quidem humectat, et calefacit, sanguinis multitudinem attrahens*; “ Because “ it moistens and heats, attracting the blood in “ greater

ⁱ Lib. i. cap. 16. p. 94, &c.

^k Lib. iii. cap. 27. p. 179.

“ greater quantity to the part ^l.” To the same purpose tends cudgelling; or, as Galen calls it in the same place, beating, *ἐπιχρούσεις*, which was a gentle beating of any certain part of the body, which wanted to be increased in its bulk: for this purpose they made use of small light rods well oiled, with which they beat the wasted part till it began to grow red and swelled; which I have likewise mentioned upon another occasion in the comment to §. 35, n^o 1. But it is also of great service to whip the part affected with nettles, and by this remedy alone we read of the palsy being suddenly and perfectly cured ^m. Celsus, as was said a little above, had before recommended this remedy; and Aretæus ⁿ has ordered the limbs to be whipped with nettles, to rouse lethargic persons: for that fine down, which appears upon the leaves and stalks of this plant, is composed of sharp spiculæ, which irritate by pricking, and perhaps likewise drop a small quantity of liquid into the little wounds which they make; whence a troublesome sense of heat, a redness in the skin, and itching tubercles. The *alumen plumosum*, as it is called in the shops, has the same effect, and occasions very troublesome itching in whatever part of the body it is rubbed upon. There are several other acrid plants besides, which being beat to pulp, and applied to the paralytic parts, excite pain and inflammation. Almost all the species of the ranunculus, the root of horse-radish scraped down, the bulb of onions and garlic, bruised mustard-seed, &c. produce this effect. The chemists have recommended acrid volatile alkaline salts, and hot empyreumatic oils drawn from animals or plants by means of fire, as the oil of hartshorn, guaiacum wood, &c. which, being applied to the part affected, sometimes occasion such a violent pain and inflammation as will soon produce a gangrene. Whence Aretæus ^o has judiciously advised, to remove these applications frequently, and examine the part, whether any pustules appear upon it,

^l Method. Medend. lib. xiv. cap. 16. Charter. Tom. IX. p. 356.
^m Académ. des Sciences, l'an 1741. hist. p. 103.
ⁿ De Curat. Morbor. Acutor. lib. i. cap. 2. p. 80. ^o Ibid.

it, which is a sign of a threatening mortification there (see §. 427); and then they ought to be taken entirely away. Alpinus ^P affirms, that the Egyptians had attempted the cure of the apoplexy, epilepsy, and palsy, successfully, by burning: for which purpose they used a tent made of cotton, of a conical figure, the basis of which was applied to the part affected, that the fire might gradually approach it from the apex; almost in the same manner as a certain people in Asia use the *moxa*, which is prepared of the scraped leaves of mugwort. So obstinate and tedious a disease requires that nothing be left unattempted, tho' ever so troublesome, from which a cure can be expected.

§. 1070. **B**UT great care ought to be taken, that all the remedies (1068, 1069.) be applied to the seat of the cause, if possible: the part or parts hurt, a knowledge of the muscles and nerves, their union, origin, and distribution, and likewise of the functions depending upon each of these, if they are compared all together, will clearly point out the latent seat of the disease.

As that cause which renders a nerve unfit for transmitting the animal-spirits, and so produces a palsy, (see §. 1059.) may be lodged in different places, it sufficiently appears, that the best success may be expected from remedies, if they are applied to that part which the cause immediately occupies, that they may act as much as possible with their whole force upon it, both in attenuating, moving, and stimulating. It is therefore of the greatest use, in curing a palsy, to distinguish well the part where the cause of it is seated. It is true indeed, that the seat may be in the brain itself, and there hinder the free influx of the spirits into the very origin of the nerves which are sent to the paralytic parts, as happens in the perfect apoplexy, in which 'there is a palsy of all the voluntary muscles.

And indeed, after an apoplexy, such palsies of particular parts frequently remain, and continue for life, while the fault is in the very origin of the nerves in the brain: and then there is no room for topical remedies, acting upon the seat of the disease; but those only are of service which are mentioned in the cure of the apoplexy. Farther, sometimes a palsy of a particular part immediately precedes an apoplexy, the cause in like manner being lodged in the brain, which soon after being increased oppresses the whole sensory. But in both cases there either are present, or very soon follow, several other diseases of the animal-functions; which evidently demonstrate, that the cause of all those complaints is lodged within the cranium. But when all the senses, both external and internal, remain perfect, and a palsy seizes a certain part of the body; then topical remedies, frictions, blisters, ointments, plasters, &c. ought to be applied to that place, where the nerves, distributed to the part affected, go out of the medulla spinalis. Thus for example, if the lower extremities should become paralytic, all those applications ought to be made near the last vertebra of the loins: if the upper extremities are affected in the like manner, the same application should be made to the last vertebra of the neck: the same is true in other particular palsies. A true knowledge of anatomy directs us best in this case: and Eustachius's tables demonstrate very exactly the origin of the nerves, and beautifully delineate their whole course; so that by viewing these plates, the place may be easily determined to which these topical remedies ought to be applied in different species of the palsy. Galen, who was very well skilled in anatomy, inculcates this strongly: " If any one knows from anatomy, to what part each
 " of the nerves, going out from the medulla spinalis,
 " tends, he will easily find out the seat of the disease,
 " &c. For a great many physicians inconsiderately,
 " and without effect, order the legs and arms to be
 " rubbed constantly with heating remedies, neglecting
 " the part where either the medulla spinalis itself, or
 " some

“ some nerve or other going out of it, is hurt ^a.” The truth of this he confirms afterwards by several practical examples. Trallian likewise gives us some excellent diagnostic rules, by which the seat of this disease may be known, as follows: “ If any of the upper parts of the body are affected, *viz.* the eyes, nose, tongue, or any part of the face, it appears, that the seat of the disease is in the brain; and therefore medicines must be chiefly directed thither: But if none of the above parts are hurt, neither in their feeling nor motion, or both, we may take it for granted, that either the spinal marrow, or some of the nerves going out of it are affected. We ought therefore to attend diligently to the diseased part, and observe whence the complaint takes its origin, from what vertebra or nerve it is derived, and so apply the cure accordingly; and not, as is commonly done, to regard only the symptoms. Wherefore you ought to examine the paralytic part in this manner, giving close application to the study of anatomy ^b.”

I am very conscious, that these axioms of the ancient physicians have been of very great service to me in practice; and I remember with pleasure, that I have several times happily cured a palsy of the arms, succeeding the colic of Poictou, by frictions, aromatic plasters, &c. applied to the belly only; although I own I do not understand from the anatomical history of the nerves, how those dispersed through the abdominal viscera, by being tormented with a troublesome and obstinate pain, should produce a palsy in the arms, with an atrophy of the muscles. It was sufficient for me to know that the disease had its origin in the abdominal nerves; and I had learnt from experience in other diseases, that many nerves had a surprising influence upon other parts of the body, which cannot be well explained from what is hitherto known of the animal œconomy: of which fact, very well deserving the attention of physicians, we shall have

C c 2

more

^a De Locis Affectis, lib. iv. cap. 7. Charter. Tom. VII. p. 465.

^b Lib. i. cap. 16. p. 88.

more instances in the epilepsy, the disease we are next to treat of.

Of the EPILEPSY.

§. 1071. **V**ERY opposite to the former disease is the Epilepsy; which is said to be present, when a person suddenly falls down, losing all the senses both external and internal, with a violent, involuntary, reciprocal concussion of all the muscles, or of some of them, with an alternate relaxation, and a returning paroxysm.

Ἐπιληψις, ἐπιληψία, τὰ ἐπιληψίκα, amongst authors, signifies that disease which is here treated of: all which names are derived ἀπο τῆ ἐπιλαμβάνειν, from *laying hold of*: because as the officers suddenly lay hold of a guilty person unexpectedly, so that dreadful disease attacks all at once, and in a moment prostrates, persons who were before in health, and in the middle of their occupation. They have likewise called it ἱερὴν νόσον, *the sacred disease*; which name we find in Hippocrates ^a: either because it was thought to be sent down by the gods; or because every thing *great* was sometimes called *sacred* ^b. For in this last sense anatomists likewise called the os sacrum (ἱερὸν ὄσυν): and we see also, that the Roman authors have called every thing that was remarkable and great, “sacred:” *sacra anchora, auri sacra fames*, &c. “the sacred anchor, the sacred “thirst of gold, &c.” For the same reason also Celsus ^c has called the epilepsy *majorem morbum*, “the greater “disease.” They have likewise named it *morbus Herculeus*, “the Herculean disease,” because Hercules was believed to have had it ^d: or rather, as Galen ^e hints, they named it thus to signify the greatness of the

^a De Morbo Sacro, cap. 1. Charter. Tom. X. p. 475. ^b Aret. de Causis et Signis Morbor. lib. i. cap. 4. p. 28. ^c Lib. iii. cap. 23. p. 172. ^d Aristot. Probl. sect. 30. quæst. 1. Tom. IV. p. 227. ^e Comment. in lib. vi. Epidem. Charter. Tom. IX. p. 550.

the disease. Perhaps likewise they might call it so upon account of the difficulty of curing it; and because there was required the strength of a Hercules, to hinder the wretched patients, in the time of the paroxysm, from hurting themselves, by thumping, and tossing about their limbs, &c. I myself have seen four very strong men hardly able to hold a weakly young girl, in the time of an epileptic fit. The sacred writers have called epileptic persons *σεληνιαζόμενος* ^f, *lunatic*. And what is said in other places ^g concerning the same disease, confirms this assertion: For that wretched boy whom our Saviour cured, had laboured under this disease from his infancy: he had fallen both into the fire and water, had lost his speech and hearing, he presently roared out as soon as he fell down, foamed at the mouth, grinded his teeth, &c.; all which symptoms accompany the epilepsy, as we shall see afterwards. But as that disease, at its first beginning, frequently seizes the person in the night-time, and about the change and full of the moon frequently rages with repeated attacks, hence they seem to have attributed it to the moon, which is also mentioned by Aretæus ^h.”

We read likewise that the epilepsy was called *morbus comitialis*, “the assembly disease:” either because epileptic persons were more frequently observed to be seized with this disease in a crowd of people; or because those meetings, by the Latins called *comitia*, were adjourned if any one happened to fall down epileptic; for thus we read in Serenus ⁱ:

*Est subiti species morbi, cui nomen ab illo est,
Quod fieri nobis suffragia justa recusant.
Sæpe etenim membris atro languore caducis
Consilium populi labes horrenda diremit.*

But on account of the violence of the disease, some have called it, by way of eminence, *morbum fonticum*, “the hurtful disease;” because by this name was understood a disease of a very violent nature, and capable

C c 3

^f Matth. iv. 24. xvii. 15.
Luke ix. 39, &c.
Sammon. p. 162.

^h Loco modo citato.

^g Mark ix. 18, &c.
ⁱ Q. Sereni.

pable of hurting the patient very much^k. They have likewise named it *morbis caducus*, “the falling sickness;” because the patients, when they are seized with this disease, fall down: and by this denomination it is termed in several languages. It is likewise named the *puerile disease*, because it is most frequent at that time of life^l.

But as that disease is attended with a great number of symptoms, as will afterwards appear, such of them ought to be picked out as always accompany it, in order to give a just and distinctive definition of the epilepsy, and point out the diagnostic signs which shew it to be present. If therefore all the senses both internal and external are quite abolished, and at the same time the muscles are convulsed independent of the influence of the will, this is a true epilepsy. Thus it is distinguished from a *palsy*, in which there is a flaccid immobility of the muscles; from the *catalepsy*, in which all the senses indeed are abolished, but the body retains the same posture which it had at the first attack of the disease; and from the *apoplexy*, because in this, together with the cessation of the senses and voluntary motions, there is joined the appearance of a profound and constant sleep, without convulsions. It is true indeed, that apoplectic persons are sometimes convulsed a little before death, but in that case the epilepsy succeeds the apoplexy. Wherefore the diagnostic signs of the epilepsy may be reduced to these two; *viz.* a cessation of the senses, and a perturbation of the voluntary motions. But these violent and involuntary convulsions of the muscles are repeated reciprocally: for when the convulsed muscles are rigid and not relaxed, then the disease is called a *tetanos*, provided the whole body is in that rigid condition; but a *spasm*, if it affects only a particular part; of both which we shall treat afterwards in the comment to §. 1088: but here we treat of the perfect epilepsy, properly so called.

In the mean while, the physician ought to be cautious

^k Aul. Gell. Noct. Attic. lib. xx. cap. r. ^l Hippocrat. de Acre, Locis, et Aquis, text. 11. Charter. Tom. VI. p. 190. Aeginet. lib. iii. cap. 13. p. 29, versa.

tious in the diagnosis of this disease; because it frequently happens, that impostors counterfeit themselves epileptic in public places, in order to extort charity of those who pass by, and afterwards laugh within themselves for having imposed even upon physicians. But the deceit is easily detected, if, when you are feeling the pulse, you pinch the skin pretty hard with your nails: For then, if they counterfeit the disease, you will presently observe them shew symptoms of pain; whereas, in the true epilepsy, the senses are so entirely abolished, that, in the time of the paroxysm, such wretched patients have fallen into the fire, and burnt themselves to the bone without any sense of pain. Boerhaave mentions a case of a young nobleman, of a naughty disposition, who, if his parents denied him any thing he wanted, immediately counterfeited this disease. When the doctor was called, he ordered a surgeon to touch his great toe with a hot iron, upon which he immediately jumped up; and being afterwards given to understand, that upon the next paroxysm the cautery must be applied, he never durst counterfeit the disease any more.

But it is usual for this epileptic fit to go off, and return again in the same manner after some time; upon which account it is reckoned amongst the *chronical* diseases. Nevertheless it is certain, that persons have sometimes died in the first epileptic paroxysm; in which case it deserves to be classed with *acute* diseases. For this reason Aretæus has ranked the epilepsy both amongst chronical, and acute diseases, saying, “ The
“ first fit of the epilepsy is dangerous, if the attack is
“ acute, for sometimes it kills the patient in one day;
“ it is likewise dangerous when the paroxysms as they
“ return grow more severe: whence the epilepsy has
“ been reckoned amongst the number of acute diseases.
“ But if a person is accustomed to it, and the
“ disease turns out obstinate, it not only becomes tedious,
“ but in some it continues for life ^m.” How many

^m De Causis et Signis Morbor. Acutor. lib. i. cap. 5. p. 1. et de Causis et Signis Morbor. Diuturnor. lib. i. cap. 4. p. 28. et de Curat. Morbor. Acutor. lib. ii. cap. 5. p. 84.

many instances have we seen, of children being killed by only one paroxysm? In acute diseases of adults, one epileptic paroxysm has likewise frequently been observed to be mortal. I saw in a woman in labour, of her first child, after she was pretty far advanced in years, a very shocking fatal epileptic paroxysm in the last labour-pains, although she had never in the least been subject to that disease before. On the contrary, I knew a man, who, from a sudden and violent fright, when he was twenty-five years old, fell down epileptic, and struggled with this disease to the age of fourscore, the paroxysms returning at various intervals. It appears therefore, that in this disease the alternate cessation and renovation of the paroxysm frequently obtains, but is not absolutely necessary in the definition of the epilepsy, as sometimes one paroxysm only carries off the patient; which Hippocratesⁿ also has observed; and Celsus, who writes thus, *The person immediately falls down, and foams at the mouth; then after a while he recovers himself, and rises of his own accord. This disease attacks men more frequently than women, and is usually tedious, continuing for life, though not mortal. In the mean time, while it is recent, it sometimes kills the patient*^o.

§. 1072. **T**HIS disease seems so wonderful from its various appearances, that it has been attributed to the gods, dæmons, the divine wrath, incantations, and the like supernatural causes.

It is by no means surprising, that this disease, being attended with such terrible and various symptoms, should be imagined to be owing to supernatural causes. A person who is perfectly well, so that even the most skilful physician could not discover the least symptom of

ⁿ De Morbo Sacro, cap. 4. Charter. Tom. X. p. 480.

^o Homo subito concidit, ex ore spumæ moventur, deinde interposito tempore ad se redit, et per se ipsum confurgit. Id genus sæpius viros quam fœminas occupat, ac solet quidem etiam longum esse, usque ad mortis diem, et vitæ non periculosum. Interdum tamen, cum recens est, hominem consumit. Lib. iii. cap. 23. p. 172.

of bad health about him, is frequently struck in a moment with this disease; and after the paroxysm has spent itself, and the body (fatigued with such violent convulsions) has been refreshed with rest, sometimes no effects of the epilepsy are left behind, and the health is perfectly restored; although there remains a latent disposition in such a person, which may occasion a new paroxysm a long time afterwards. During this time, *viz.* the intervals between the paroxysms, there is frequently nothing to be observed amiss in the body. There is no sign can be discovered, even by the most penetrating and skilful physicians, by which they can find out, that such a person is subject to this disease; and therefore they have long ago ascribed the origin of the epilepsy to superior causes, and attempted a cure of it by various charms and expiations. The truth of this assertion we see in Hippocrates^a, who did not reckon this disease more sacred than tertian and quartan fevers, which return at certain intervals; although the reason may not be readily understood, why the new paroxysm returns in a determined period of time: and therefore he explodes those vain superstitious remedies, by which cunning impostors pretend to cure this disease, concealing their want of skill by sacred rites, and a number of diætic precepts. For they have mentioned so many impediments to the cure, that it would be impossible for the patient not to forget some of them; and thus they could always throw the blame upon him, if the disease should not be cured. Thus, for example, amongst a great many other things, they ordered the patient to beware of ever placing one foot, or one hand, upon the other. But who could avoid this, even with the greatest attention in the world, when such a cure was frequently to be protracted for several months? Hence they always had a subterfuge, on which to lay the blame of the bad success of the cure; and though the patient should observe all the precepts enjoined with the greatest exactness, (which hardly appears possible), in case he should not be cured, they had still this reason to give for it, that the gods, who

^a De Morbo Sacro, cap. 1, 11, Charter. Tom. X. p. 475, &c.

who had inflicted it, were not yet pacified. But for the various symptoms which accompanied the epilepsy, they assigned different deities, which ought to be appeased; as you may read in the places above quoted.

It is certain, that this disease is produced from such causes as have been observed by the senses, and that it has been cured by removing those causes, as will afterwards appear. But at the same time the greatest physicians and most skilful anatomists have confessed, that, in the bodies of those persons who have died of the epilepsy, they frequently have not found any thing that they could blame for it. In the worst kind of epilepsy, which is called *idiopathic* or constitutional, the cause of the disease is lodged in the brain; and sometimes is extremely difficult to be discovered, seeing we know so little hitherto of the intricate fabric of that viscus. Anatomists have described the size, figure, membranes, and convolutions of the brain and cerebellum, and have distinguished the tuberosities of the medulla oblongata by very strange names, &c. but not one of them has hitherto determined the seat of the memory, nor the origin of that corporeal power which moves the muscles at the command of the will, nor a great many things besides; which was mentioned before in the comment to §. 276, where, in the History of Wounds of the Head, we treated of determining the part affected in the brain. There might be a fault therefore in the wonderful fabric of that viscus, capable of producing great disturbances, altho' it could not be observed by the senses, especially after death; whence it may justly be concluded, that this disease ought not therefore always to be attributed to supernatural causes, although no cause obvious to the senses can be discovered. But can it be absolutely denied, that this disease was never produced from supernatural causes? Certainly not; for that epileptic boy, who is mentioned in the comment to the preceding aphorism, was cured by our blessed Saviour, by casting out the devil. I know very well, that some very great physicians have alleged, that this disease was produced from natural causes; and that the cure of
such

such a disease, which he had been subject to from his infancy, was equally as miraculous as the casting out of the devil; but certainly this opinion appears not to be favoured by the text^b, which runs thus: “He rebuked the unclean spirit, saying unto him, “Thou deaf and dumb spirit, I charge thee come out of him, and enter no more into him. And the “spirit calling aloud, tore him very much, and came “out of him.” His disciples asking him privately afterwards, why they were not able to throw out the spirit, he answered, “This kind can come out by nothing but by prayer and fasting.” But it was usual for Christ (as appears from several passages of scripture) to explain to his disciples afterwards what he had spoke before his hearers in public, and which they had not sufficiently understood: but here he speaks to them in such a manner, as manifestly confirms that opinion which they had of the disease being produced in the boy from an evil spirit. Certainly those demoniacs which we read of in scripture^c, had the same symptoms that are observed in mad people; but it is positively asserted in the text, that devils were cast out of those wretches, and, having obtained leave, entered into a herd of swine, which, becoming immediately mad, rushed down a steep place into the sea. Can that text by any means be understood of a melancholic delirium, or a madness produced from natural causes? Hence it appears, that the same diseases have been produced from supernatural, which we have known to arise from natural causes. I have seen an innocent boy of four years of age, who, as soon as he began to repeat the Lord’s prayer, was immediately convulsed; and at the same time gave a loud frightful roar, that seemed far to exceed his strength: after some minutes, I desired his grandmother, who brought him to me, to order him again to repeat the same prayer, and this four times running, always with the same event; and though I was forewarned of what would be, and put on a strong resolution, yet I could not help being fright-

^b Mark ix. 25. Luke ix. 42.
Mark v. 2. Luke viii. 27.

^c Matth. viii. 28, &c.

frightened at hearing him bawl out, although I do not look upon myself to be so timorous as to be easily moved upon slight occasions: Upon examining all the circumstances with scrupulous exactness, I could not find the least cause of suspecting any imposition. Hence it seems to be the part of a prudent physician, neither always to have immediate recourse to supernatural causes, when unusual symptoms appear in diseases; nor, on the other hand, to pronounce those things to be impossible, which we know certainly to have happened. For as the celebrated Hoffman very well observes from Pliny, “As a great many things are judged to be impossible, before they are done; so likewise, many things which were done formerly we rank with those things which are impossible, because we do not see them, nor are capable of accounting for them: which is certainly great folly ^d.” That treatise upon this subject deserves very well to be read.

§. 1073. **F**OR there is no gesture, distortion, or posture known, which it has not sometimes represented; and sometimes also it imitates all kinds of motion, running, walking, wheeling round, falling prostrate, lying, standing upright, and having the body quite rigid.

We come now to treat of the various and wonderful symptoms which are observed in epileptic persons in the time of the paroxysm. They are certainly very numerous; and I shall attempt to relate them in the same order as I have observed them myself, or collected them from authors of undoubted veracity.

But in the first place we must describe the most perfect epilepsy, in which a person is suddenly thrown down, with a cessation of all the senses internal and external, and a convulsive agitation of the muscles. In the worst species of all, without any warning symptom,

^d De Diabol. Potent. in Human. Opusc. Physico-medic. Tom. I. p. 364.

tom, they fall down immediately; and experience teaches us, that this is almost always incurable. More frequently at first they feel a swimming in the head, perceive sparks before their eyes, and a purple or black colour, or variegated like that of the rainbow^a; some fancy they hear strange kinds of sounds; others are sensible of a disagreeable smell, or a bad taste in the mouth. I have seen some, who observed a small spark appear before their eyes, which was suddenly increased, till it grew to the size of a large sun-beam. Others have imagined they saw all objects as if they were involved in a cloud; and this darkness suddenly increasing, they fell down: Aretæus^b has likewise remarked this, calling it *ομίς φαντασιν*, an apparition of the sky. Some feel as it were a cold blast ascend from the finger or toe, or from some other part of the body, which, as soon as it arrives at the heart, they instantly fall: the patients recollect all those sensations as soon as they come out of the paroxysm, but are ignorant of every thing that happens during the fit. Whence afterwards, when they have suffered several paroxysms, they can foresee the fit a-coming by those previous signs, and take care of themselves as much as they are able, or beg the assistance of those who are near them. Most of them, the moment they fall, give a loud roar; which, however, they are not conscious of: then follow, for the most part, various surprising convulsions of the muscular parts of the body, different in different epileptics.

For the forehead and hairy scalp are sometimes strongly convulsed; the hairs stand on end; the eyebrows are moved, depressed, and contracted, as when a person is in a passion: the eyes then appear fixed, stern, and prominent, as if they were angry; the eye-lids are convulsed, and for the most part closed, but winking and tremulous, seldom quite shut, so that the white of the eye appears between the borders of the eye-lids^c; and frequently the bulbs of the eyes are rolled with great velocity under the half-shut eye-lids,

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but

^a Aretæus de Causis et Signis Morb. Acut. lib. i. cap. 5. p. 1.^b Ibid. p. 2.^c Ibid.

but in such a manner as that the pellucid cornea is almost always hid under the upper eye-lid. Sometimes by these convulsive motions such a force is communicated to the muscles of the eye, that the effect remains ever after; and we observe a great many squint, or have one eye quite shut, which they have contracted by epileptic convulsions in their infancy.

But that moveable part of the face, which reaches from the eyes down to the chin, and is composed of a great number of muscles, found by anatomists to be different almost in every different body, and by the change of which part alone painters and statuaries know how to express all the affections of the mind, is usually convulsed in a surprising manner. Sometimes all the passions are expressed in those wretched patients with a very quick vicissitude; the lips, contracted and elongated, are thrust out into a sharp beak; immediately they are drawn back, and pull the mouth open almost to the ears, which the celebrated Boerhaave saw repeated with such celerity in an epileptic Jewish woman that it made the beholder giddy.

The lower jaw is sometimes pulled with such force from the upper, that it is luxated forwards: and in a poor child, when the paroxysm was over, this luxation not being reduced, it remained during life, which was for several years; but it turned out an idiot, and being received into the hospital moved the compassion of every body. The tongue, at that time swelled and elongated, is thrust out of the mouth, and unless the by-standers take care to prevent it by putting a cork or some such soft body between the jaws, immediately after, the tongue being intercepted betwixt them forced together by the convulsive motion, is grievously wounded, or perhaps a part of it entirely bit off; which Aretæus^d likewise remarks. It very frequently happens, that the tongue is bit in the time of the paroxysm; and then blood is voided with the foam, which is a shocking sight. This happens when the motion of chewing is produced by those strong muscles, which serve for that office: then a disagreeable grinding

ing of the teeth is heard; and I remember, not without horror, to have seen fragments of the grinders broke forcibly off in a delicate young girl.

The head is bent and surprisngly rotated; sometimes the neck is inflexibly rigid, sometimes bent so much forwards, that the lower jaw is pressed hard against the breast; in others the head is bent backwards to the scapula, in the same manner as if they were pulled back by the hair; all which Aretæus^e has likewise observed.

In the arms, hands, and fingers, all the motions of extension, flexion, rotation, pronation, and supination, are produced: And as the thumb has a greater number and stronger flexors and adductors than the rest of the fingers, hence it is usually pulled in very strongly towards the palm of the hand, which many look upon as a sign of a violent paroxysm; and because they observe, when the paroxysm remits, that the thumb is again abducted from the palm, therefore they frequently attempt to extend the thumb in the middle of the fit, and thus sometimes they strain those parts very much, by endeavouring to overcome the strong force of the convulsed muscles by violence, whence very troublesome pains remain in those parts afterwards. If the hands thus contracted can be extended by a gentle force, there would be no harm in trying it; but how imprudently do those rough and frequently very strong persons act, when they attempt to do this with all their force? In the thighs, legs, and feet, &c. these motions cannot be so well observed, because the parts are covered with clothes; but that there are such appears from hence, that they kick strongly with their feet. Aretæus^f says, “That this kicking resembles that of bullocks when they are slaughtered.” For it is observed, that those animals, when the blood flows from the wounded large vessels, a little before death are strongly convulsed from the emptiness of the vessels, and kick with their feet.

But that the internal parts of the body are in like manner convulsed, appears from the belchings, rumbling

bling of the guts, vomiting, and voiding the fæces and urine insensibly; as also from the excretion of semen by the convulsed erector muscles. The vital actions likewise are very much disturbed^s: for in the beginning of the paroxysm, the pulse is quick and small; and at the end, it becomes fuller, but languid and more slow; and, as Aretæus has very well observed, in general the pulse is much out of order (*ατακτοι*), which I have found to be the case in all epileptic persons whom I have seen in the time of the paroxysm. The respiration likewise is surprisingly disturbed. In the beginning of the paroxysm, the muscles of the voice are usually affected, for they almost all fall down with a roar: afterwards they make a violent effort to respire, such as you see in persons who are in danger of being suffocated; and give the same kind of groan as you hear in strong men, while they attempt with all their force to lift a heavy burden, or to remove an obstacle out of the way. This symptom seems to have made the ancients believe, that the epilepsy was nothing else than an effort of the brain to disburden itself of something malignant or an oppressing phlegm. But the respiration being hindered, the blood cannot be transmitted freely through the lungs, and therefore the right ventricle of the heart cannot evacuate itself: whence the venous blood is accumulated near that ventricle, and all the conspicuous veins appear very turgid, especially those of the forehead, the raninæ under the tongue, and the jugulars in the neck. Then the face begins to grow livid; nay, almost black; first under the eyes, about the lower eye-lid, where the skin is very lax; and likewise about the lips, almost in the same manner as in those who are strangled; which Aretæus has very justly remarked, saying, “ In the beginning the cheeks are
 “ red: but when the paroxysm is advanced, both the
 “ cheeks and face contract a livid colour, the vessels
 “ of the neck are distended, and the voice is like that
 “ of a person who is almost suffocated; although you
 “ bawl out very loud, they do not hear you; they have
 “ no

“ no voice but that of groaning and sighing; and
 “ they respire and seem suffocated, like persons who
 “ are strangled ^h.”

But while the arteries of the nose, mouth, and fauces, are not able to empty themselves into the over turgid veins, the lateral secretory branches are so much the more filled, and a mucus more viscid than usual is expressed; (which is confirmed by what was said in the comment to §. 819. as likewise by the experiment made by Lower, of tying the jugular veins of a dog, which was mentioned before in the comment to §. 793.) The same thing likewise happens in the lungs; and then that disagreeable snorting is heard, and a very viscid foam is voided by the mouth and nose, detestable to the sight, and sometimes also bloody if the tongue happens to be wounded by the teeth in the time of the paroxysm; and this foam is so tenacious, that it may be drawn out in threads. All these Aretæus ⁱ has very well remarked; and, together with Aurelianus ^k, has observed, “ That before the fit is
 “ over, a plentiful foam is voided by the mouth and
 “ nostrils.” But that Aurelian understood this to happen about the end of the paroxysm, appears from another passage, where he teaches how the hysterical fits may be distinguished from a perfect epilepsy: “ Epi-
 “ leptic persons and hysterical women frequently suf-
 “ fer in the same manner, for they are both alike de-
 “ prived of their senses; but they differ in this, that
 “ in the last part of the hysterical paroxysm they do not
 “ foam at the mouth and nose ^l.” This deserves chiefly to be remarked for this reason, Because that viscid phlegm, which is voided at the end of the paroxysm by the mouth and nostrils, gave a handle to the ancients for conjecturing that this pituitous humour was the only and true cause of the epilepsy ^m; and that this being expelled, the paroxysm ceased. But it appears from what has been said, that the excretion of that phlegm was rather the effect, than the cause of the disease; and in the comment to §. 1075. it will be

D d 3 shewn,

^h Ibid. ⁱ Ibid. ^k Morbor. Chronicor. lib. i. cap. 4. p. 293.

^l Ibid. p. 295.

^m Hippocrat. de Morbo Sacro, passim.

shewn, that there are several other causes of this wretched distemper known from accurate observations; and, therefore, that dissolving and evacuating that lentor alone, is not sufficient to effect a cure.

It is evident likewise from what has been said, that the greatest danger is about the end of the fit, when a suffocation is threatened; and thus sometimes they are carried off by one paroxysm, as was said before in the comment to §. 1071. But for the most part it ends in the following manner: After that threatening suffocation and evacuation of foam from the mouth and nostrils, the convulsions begin to diminish, the respiration becomes more free, but snoring, with a profound sleep, as if it was apoplectic, which varies in its duration in various patients: afterwards they awake from this sleep, unmindful of every thing that passed during the paroxysm: but then, as Aretæus has justly observed, “ From the first, their limbs are
“ torpid; they feel a heaviness in their head, or a
“ weak languid pain; they are pale, pusillanimous,
“ and melancholy, from the fatigue and shame of the
“ disease.” In many, both a dulness of the senses, and a weakness of the memory remain: yet after two or three days, the strength being restored by a good diet and rest, the health is frequently so perfectly recovered, that no vestige of the disease remains; and after some interval, often a pretty long one, the disease returns attended with the same symptoms. In this case, it was called by Aretæus a chronical epilepsy: but if by one fit only it either killed, or cured, then it ought to be referred to acute diseases.

But the chronical epilepsy has very various intervals between the paroxysms. I have seen some who were only seized once a-year; others have a fit in spring and autumn: some have a fit once a-month; others at the full and change of the moon, and therefore twice a-month: I have seen a good many, who have suffered several paroxysms in the space of twenty-four hours.

But as that involuntary motion, in the time of the
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paroxysm, sometimes affects all the muscles, and sometimes only some of them; and frequently these motions of different muscles succeed one another; it easily appears, that an incredible variety of symptoms must occur in the time of the paroxysm in different epileptics. Hence, as gesticulations, and all the changes of posture of the body, are produced by means of the muscles; we may easily understand, what surprising ones may happen here, and such as cannot easily be imitated by the command of the will upon the muscles in the time of health; because in epileptic persons they act with much greater force; whence disagreeable deformities and distortions frequently remain afterwards, as will be said by and by. You may read several examples of surprising epilepsies in Schenckius °.

§. 1074. **Y**ET all those varieties consist only in changing the motions of the moveable parts, and consequently of the muscular; wherefore they only suppose various contractions of the muscles; hence various influxes of the nervous liquid, and thence the various distribution of it from the common sensory to the nerves; and lastly, therefore, various causes in the medulla of the brain producing these distributions, &c.: which are best known from the historical account of them.

We come now to speak of the causes of the epilepsy which have been observed, to which those wonderful symptoms may be attributed; and, at the same time, of the part of the body to which these causes are applied, while that disease takes place.

But that these things may be clearly and evidently understood, it must be observed from physiology ^a. That the causes of diseases are twofold, *viz.* either immediate or remote. The *immediate* cause is that, which being present, constitutes the dis-

° Lib. i. p. 103. et seq.

^a Boerh. Instit. Med. p. 740. et seq.

disease, and when absent it is cured. But the *remote* cause of the disease is that, which so disposes the body, while it is present, as to render it fit to receive the disease, provided another cause should be joined to it: therefore neither of these causes existing alone produces the disease, but being united together they constitute the disease. The remote cause, inherent in the body, is called the *predisponent*: the other, which comes after it, is called the *procatarctic*, or simply the *occasion*; which is only hurtful to those in whom the predisponent cause existed.

These things being premised, let us consider, that in the epilepsy all the senses both internal and external are abolished, and that at the same time the muscles are violently convulsed. But it appears from what we said concerning the Apoplexy and Palsy, that the cause moving the muscles was derived to them from the brain through the nerves; and the exercise of the senses was performed, while the change produced in a nerve by sensible objects acting upon the organs of the senses could be freely propagated to the origin of the nerves in the brain. And therefore, at the time when the epileptic paroxysm is present, the brain, which is the origin of the senses and muscular motion, is affected: and in such a manner, that no perception of sense remains; but the strongest muscular motions are excited. But those muscular motions cannot be produced, unless the cause of those motions be derived from the brain by the nerves to the muscles; and therefore the cause producing the epileptic paroxysm, ought to dispose the medulla of the brain to determine the most powerful causes of such motion to the origins of the nerves. Wherefore various phenomena will occur in various epileptics during the paroxysm, according as the cause of muscular motion is derived to these or those nerves, with a greater or smaller impulse, all at once or successively. Hence Ægineta ^b has very well said, that in the brain and its ventricles the cause of the epilepsy was lodged (συνεσκαμμένην ἔχει τὴν αἰτίαν;) because it is a convulsion

^b Lib. iii. cap. 13. p. 29. versa.

sion of the whole body, with a hurt of the principal faculties of the soul: although he acknowledged, that an epilepsy might be produced, by consent (*κατὰ συνπαθειαν*), both from the stomach, uterus, and other parts of the body. For that morbid cause, in whatever other parts of the body it is lodged, does not produce the epilepsy unless it affects the brain; and the patients frequently feel something ascend towards the head from a certain part of the body, for example the foot, and presently after fall down epileptic, unless that ascent can be suddenly hindered by a ligature or a strong compression of the part, as will be said afterwards.

From all which it appears, that the immediate or entire and adequate cause of this disease, in the time of the paroxysm, is lodged in the brain; but that the exciting, or procatactic cause, may be placed in several other parts of the body. But observations seem to teach us, that almost in that part, to which the change induced by sensible objects to the nerves of the senses reaches, must likewise be the origin of muscular motion: for if a fly passes near the eye of a person who is meditating, he immediately by a mechanical motion lifts up his hand very quick; which he would likewise have done from the command of the will, if he had foreseen what was to happen. But that place, to which the change of the organs of the senses reaches, and from which the origin of muscular motion is derived, physicians have called the *common sensory*, as was said before in the chapter of the Apoplexy. Hence the epilepsy is a disease of the common sensory, by which the power of sensation is abolished, but the power exciting muscular motion produces very strong effects, without either consciousness or the command of the will.

But it is observed, that after the epileptic paroxysm is quite over, and all the functions of the brain perfectly restored, such a disposition still remains, as that the paroxysm may be renewed by such causes, as in other persons, who have not this disposition, do not produce any such effect. Anger, venery, a fright
though

though only gentle, a surfeit, and a great many other things besides, produce a new fit of the epilepsy, as is very well known. There remains therefore in those persons a predisponent cause, by which they are rendered obnoxious, when the paroxysm is off, to a fresh attack of the epilepsy, if to this latent cause, which frequently does not manifest itself by any sign, another occasional cause is joined. For it is evident from certain observation, that this predisponent diathesis of the true epilepsy, although it is of the worst kind; may be present in a person, and yet not hurt any known function. Nay, it would seem as if that epileptic disposition might lie concealed during life, without ever discovering itself; seeing this disease, as will be said in the following aphorism, passes sometimes from the grandfather to the grandson, without affecting the son, who however appears to have had the same diathesis, seeing he communicated it to his offspring.

But this diathesis seems to be lodged in the common sensory, and to dispose it in such a manner, as that it can be irritated and disturbed afterwards by such supervening causes as would not have affected it before. There are a great many arguments which seem to evince the truth of this. I saw a very healthy girl of ten years of age, born of sound parents, who never had the epilepsy, rendered epileptic for several years; and the first time she was seized, was upon having her soles tickled by some girls who were at play with her, some of them holding her fast upon the floor to prevent her avoiding that intolerable sensation. There was nothing of a morbid humour that could be blamed here, neither had the head been any ways hurt; but the common sensory being once disturbed, by the nerves in the extreme parts of the body being titillated, they retained as it were that disposition impressed upon them, which afterwards renewed the epileptic paroxysm from several other supervening causes. For if she happened to see one only threatening to tickle another, she immediately fell down epileptic. And the paroxysm was likewise renewed from slight anger, fear,

or

or attention of the mind protracted longer than usual. The most skilful physicians have frequently lamented, that an incurable epilepsy has sometimes been produced from a fright, even in the healthiest bodies; and especially in such as had a great deal of agility and very quick parts.

But it is certain, that the common sensory is not equally firm in all persons; and that in some it is more easily irritated, and all its actions disturbed. The sturdy peasant, who has been used to hard labour from his childhood, has a firm strength of body, and is hardly to be intimidated by any accident; while a girl who has been delicately reared, is immediately thrown into convulsions at any sudden noise. Neither is this want of fear in the peasant to be ascribed to an invincible firmness of mind, but to the dulness and greater callosity as it were of the common sensory. But the same person is very stupid in such things as require acuteness of understanding: his limbs are very strong made, but he has no great agility; he only exercises those motions readily which his daily labour demands, otherwise there is as it were a rigidity almost in all his limbs. Hence we understand, why persons are differently affected from the same causes, according to the different disposition of the common sensory; and why those things which occasion great disturbances in some, produce no change in others.

But the younger that a person is, the greater proportion do the brain, and its appendices the medulla spinalis and nerves, bear to the bulk of the rest of the body; which both painters and statuaries observe, seeing in young persons they make the head larger in proportion to the trunk of the body. The structure of the brain is likewise observed softer in young persons; and therefore anatomists, when they want to demonstrate the fabric of the brain in their lectures, always prefer those of adults for this purpose. Hence Hippocrates, and after him all the physicians, have observed, that young persons are more obnoxious to this disease than those who are grown up: for, in the former, both the greater bulk and more tender structure
of

of the brain, seems to constitute the predisponent causes which by means of any slight accidental cause supervening produces the epilepsy. Gripes, or a tension and irritation of the gums in the time of teething, most frequently occasion epileptic fits in children, while adults suffer the most violent tooth-ach and tormenting cholicky pains without any consequent epilepsy. If a nurse is put into a sudden fit of anger, and imprudently suckles the child soon after, immediately the infant is seized with convulsions (as repeated observations inform us,) while the nurse when her passion is over suffers no harm from it. Wherefore that change, produced in the humours of the nurse by a strong passion of the mind, could not disturb the common sensory after it is grown firm with age; while a small quantity of milk, drawn from the breast of the angry nurse, occasions so much misery in the tender delicate body of the infant.

But as by age the too great softness or tenderness of the brain and of the whole nervous system is gradually amended, the reason appears why there are great hopes in curing of young persons; whereas, when this disease attacks the body after it is grown up and strong, it is with much more difficulty, nay very seldom, cured: for the cause must be strong to produce the disease in an adult, whereas in children a very slight one is sufficient. Wherefore Hippocrates^c, if the epilepsy appeared before the time of puberty, had hopes that it would go off; but when it attacked a person after the age of twenty-five, then he remarked, that for the most part it remained incurable during life. See likewise what was said in the comment to §. 712. where we treated of Convulsions in Fevers.

Helmont has very well described that latent diathesis of the common sensory, which is the pre-disponent cause of the epilepsy, saying, *Thus the epilepsy frequently lies dormant for months and years, nay, and is never roused, unless by venery, anger, grief, labour-pains, &c. Neither is there any matter, as a fomes of this disease, any where collected; because it would either corrupt, be-*
come

^c Aphor. 7. sect. 5. Charter. Tom. IX. p. 197.

come dry, be consumed, or lose its former morbid quality: which as it does not happen, but the disease continues for life, it ought to have some other origin, or immediate cause, than mere recrement. For it is locked up in the idea of an active agent, and continued for life^d. Elsewhere he has the following, which ought likewise to be referred hither: Farther, whatever dregs have been swallowed, or admitted any other way into the body, or have been produced by errors in the way of living, whether it immediately follows the procathartic cause, or the hereditary disposition to the disease, it is entirely occasional, viz. at its importunities *Archeus* being roused, he represents the true scene of the disease. Whence it is evident, that their diseases are as real while they lie dormant, as they are imagined to be when they are roused in the paroxysm^e. But it will appear afterwards, when we come to treat of the cure of this disease, that the consideration of the predisponent cause, and the distinguishing it from the exciting causes, is of very great use. For frequently it is not in the power of the physician to remove the predisponent cause; and then the only hope of a cure consists in preventing the exciting causes, that stir up that latent epileptic disposition, which alone cannot renew an epileptic paroxysm.

We come now to enumerate both the predisponent, and procatactic or occasional, causes of this disease.

§. 1075. **B**UT these are, 1. Hereditary, from a family taint of the father, mother, E c

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^d Sic namque comitialis per menses et annos subinde dormit, imo et nunquam excitatur, nisi per venerem, iram, mœroram, partum, &c. Neque est enim ulla materia, fomes caduci, alicubi detenta; quia vel putreret, aresceret, consumeretur, vel pristinam veneni labem amitteret: quod cum non fiat, verum in vitam perennet, aliud proin exordium, atque hospirium immediatum, quam recrementa delegit. Sigillatur quippe in idea entis activi, et constantis per totam vitam. In *Capitulo de Morbis Archealibus*, sect. xvii. p. 440.

^e Quidquid porro sordium ingestum, admissum, aut vivendi errore obnatum est, sive id causæ procatharticæ, sive demum familiæ, productum sectetur, totum prorsus nil nisi occasionale est: ad cujus scilicet importunitates *Archeus* ipse commotus, verum morbi repræsentat scenam. Unde imprimis perspicuum est, tam esse morbos reales, dum silent, dormiuntque, quam quos contingit expergefatos in suo meditari paroxysmo. In *Capitulo Butler, in initio*, p. 466.

ther, relations, or ancestors; the disease frequently lying dormant in the father, while it is derived from the grandfather to the grandchild.

2. Born with one, from the imagination of the mother when she was pregnant being shocked at the sight of a person in an epileptic fit. 3. The brain diseased in its membranes, surface, substance, and ventricles, by wounds, contusions, abscesses, pus, sanies, ichor, blood, acrid fetid lymph, bony excrescences on the inside of the cranium, depressions of it, the venous sinuses rendered cartilaginous, fragments or points of the bones or of instruments hurting the membranes of the brain or the brain itself, quick-silver any way conveyed to the brain; or the brain hurt by inflammation, corruption, or erosion of the membranes, from a caries of the bone, black bile, or venereal gummata. But these causes are assisted by whatever increases the afflux of humours to the brain; as, A plethora, exercise, heat, drunkenness, surfeiting, venery, an acute penetrating genius, profound meditation, violent passions, strong force of imagination, fear, and especially a sudden fright. 4. All violent affections of the nervous kind; as, Great and periodic pains, the hysteric passion, erosions, and irritations from worms, teething, an acrid humour, a cheesy acrid acid milk in infants, meconium, the infection of the small-pox, the heart-burn, an ulcerous matter lurking in some part of the body, hunger, a surfeit, acrid food or drink, medicines, and poisons. 5. From some humours being intercepted which used formerly to be excreted; as, Sanies, pus, the menstrea, lochia, hæmorrhoids, and urine. 6. By some kinds of smells which renew the paroxysm, or a fomes lodged in
some

some particular part, whence it ascends to the brain with the sense of a blast.

1. That diseases are propagated from parents to their offspring, appears from numerous observations. Nor has this been observed in the epilepsy only; for the consumption and gout likewise are transmitted from one generation to another, even to the latest posterity. But what is most surprising here, is, that sometimes this morbid fomes lies dormant for many years in the body, before it becomes active. But those hereditary epilepsies very often appear for the first time about the age of puberty, and, being propagated by the seminal contagion, discover themselves at that time, when the body is rendered fit for generation, and frequently continue afterwards during life. As children very often resemble their parents in the external make and size of the body, or else in the disposition and affections of the mind; so likewise a similitude appears frequently to obtain in the remote structure and constitution of the parts. Sometimes it also happens, that the seminal morbid quality remains inactive in the son, and breaks out upon the grandson; the son perhaps subduing this latent disposition, by a strong habit of body, an active and sober life, so that it cannot break forth; though in the mean time he communicates that fomes to his offspring. Perhaps likewise the impressed morbid character cannot yet exert itself in the first generation, and only discovers itself in the second. Examples of this kind are to be found in historians. Thus in Pliny we read the following: “ I have heard that three of the Lepidi, alternately, were born with a membrane covering the eye; each of them resembling his grandfather, &c. There is an undoubted example of Nicæus, a noble champion born at Byzantium (Constantinople,) who being begot in adultery of a black mother, though he was white himself, begot a black son^a.

We also observe several things of the like kind in nature, which lie concealed many years without any

sensible effect, and afterwards suddenly discover themselves, when the requisite conditions concur to render that latent and quiet principle active. The vital stamen, contained in the treadle of an impregnated egg, remains there quiet, and does not manifest itself by any sign. After several months, if it is put under a hen to be hatched, in about twenty days that stamen, which was before so small as not to be discovered by the senses, by the heat in hatching grows up to a chick. It is very well known, that the seeds of vegetables remain fit for several years to produce plants of their proper species, if they are committed to a fruitful soil. In the embryo, while it is contained in its mother's belly, there are the rudiments of the teeth, which remain in the bottom of the sockets for seven years and upwards, and then they are suddenly enlarged and pushed out: nay, several persons have had new teeth at a very advanced age. Puberty appears in both sexes at a certain time of life, and produces a surprising change in the body: but the rudiment of this change is present in the first formation of the person, although it is late before it bursts into action. Thus, therefore, such a morbid quality might be impressed upon the human embryo as may not break out till a certain time. Helmont considering this affair, says, *Wherefore hereditary diseases increase in the fœtus, from a morbid quality, viz. The idea impress'd upon the seminal spirit (as a disease may still lie concealed and locked up in the first vital principles of the semen) continues yet dormant or waiting its maturity, till, being roused by Archæus, and bursting out, it becomes capable of producing its effects* ^b.

2. This cause is distinguished from the former, in that it does not depend upon any seminal bad quality, but is produced in the fœtus while contained in the mother's womb, not from a cause propagated by an here-

^b Ergo morbi hæreditarii inoleſcunt fœtui, ab ente morboſo. Idea nimirum, ſpiritui ſeminali impreſſa (cum ſit ipſe morbus adhuc in vita prima ſeminis deliteſcens, et ſigillatus) adhuc dormit et ſui maturitatem expectat, donec expergefactus ab Archæi agitatione, prorumpenſque, producta ſua parere ſit apta. *Capitulum de Morbis Archealibus, ſect. xv. p. 440.*

hereditary morbid taint, but communicated to it by the imagination of the frightened mother upon seeing an epileptic person seized with a fit. But as such an unhappy infant is immediately subject to the epilepsy from its birth, therefore that disease is then called *congenial*. A case of this kind we read in Hildanus^c, of a young, strong, healthy woman with child, who was very much frightened by an epileptic person falling down almost at her feet: some months after, she was safely delivered of her first child, a boy, who was soon after seized with an epilepsy, and died of it before he was a year old, after several remedies had been tried in vain to cure him. Both the parents were sound, and afterwards the same woman bore several children who never were subject to this disease. A great many cases of the same kind are to be met with amongst observers. It is true indeed, that convulsions are observed frequently in children soon after they are born, from the meconium, or an acid acrimony, irritating the intestines, &c. but, the fæces being expelled, and the acrimony corrected, those convulsions presently cease: but in this unhappy boy the epileptic paroxysms returned till he died.

Seeing, therefore, several other observations teach us, that the imagination of the pregnant mother is capable of producing surprising changes upon the foetus contained within the uterus, the epilepsy observed in a new-born infant seems likewise to be justly attributed to such a fright of the mother. I know that all those things are denied by some persons, because they cannot conceive how a change of thought in the mother can so affect the foetus; and they laugh at men of sense as being too credulous, for believing what they have seen themselves, or have read in authors of approved veracity. I own, that I do not understand the connection of the cause acting upon the mother with the effect observed in the foetus, and why that fright should not rather render the mother epileptic than the foetus; but it must not therefore be denied, that such a thing has really happened. Galen complains of the

same thing in his time, saying, *Many physicians not being able to understand the causes of those things which are evidently seen, deny them altogether* ^d. There was a very handsome young girl once came to consult me about hysteric fits, to which she was subject. I thought I saw a canker-worm under the collar of her shift upon the skin of her neck; and being afraid of putting her in a fright, I went to take it off gently with my fingers: but she desired me, smiling, to let the canker-worm alone, which she had carried all her life-time; and readily allowed me to examine it more narrowly. I saw very evidently those different beautiful colours and the erect down of that insect; nor could one egg be more like another than that appearance of the canker-worm, prominent above the surface of the skin, was to the real one. Her mother affirmed, that while she was with child of this girl, walking one day in the garden, a canker-worm fell from a tree upon her neck, and she could hardly remove it. Another woman, three months gone with child, was frightened by an ape, which she thought was going to jump upon her arm; she ran away, and laid hold of the part which she was afraid of with her other hand, and rubbed it. At the usual time she was delivered of a healthy girl, whom I saw after she was grown up, who, on the outside of her right wrist had all the skin of a brown colour, and covered with hairs an inch and a half long. When she was about nine years of age, they shaved it with a razor, after having first lathered it well with soap; but immediately the shaved part was covered with a thick crop of pustules, and the whole arm was violently inflamed, and even tended to a mortification. However, this complaint being subdued with proper remedies, the hairs grew afresh, and that disagreeable mark of the mother's imagination remained, which the girl rather chose to bear patiently than to attempt a fresh cure.

I would ask those persons, who laugh at my credulity

^d Multi medici rerum, quæ manifeste conspiciuntur, causas reddere nequeunt, eas esse omnino negant. *De Locis Affectis, lib. v. cap. 3. Charter. Tom. VII. p. 486.*

lity in things of this kind, whether they think they understand a great many other surprising phenomena, which we know certainly to happen in the work of generation. Let them tell the causes, which erect the Fallopian tubes, at other times pendulous and fluctuating; which unfold the fimbriæ, and apply them to the ovaria? Let them explain, why the uterus after conception, having received the male seed, begins to increase in every dimension; and why the menstrua do not flow? Why, after the fœtus is expelled, the uterus decreases, and the breasts become larger? How the fœtus is connected to the umbilical rope? How the placenta is produced, and fixes itself to the uterus, &c.? I believe it would be a hard task for even the most subtle philosophers to demonstrate the connection of the cause with these effects, which nevertheless nobody can deny the existence of. Wherefore the effect of the mother's imagination upon the fœtus cannot be more justly denied for this reason, because the manner is not understood by which this change of the fœtus has been produced.

3. It was said in the preceding aphorism, that the brain is affected during the time of the epileptic paroxysm; and therefore it is no wonder, that those things which hurt the brain should likewise very frequently produce the epilepsy. In the history of Wounds of the Head, it was several times proved, that the worst kind of convulsions are produced from the brain being hurt by a sharp instrument, or by a strong contusion of the head; as likewise from an extravasation of blood in the cavity of the cranium; and much more, if the blood, and other extravasated humours, by time and stagnation should degenerate into an acrid eroding ichor. But in all those cases a violent wounding or contusing cause was applied to the head. However, it happens likewise, that humours may be accumulated by degrees, and without such preceding causes, which either by their bulk may compress, or by their acquired acrimony hurt the substance of the brain, and thus may be able to produce this disease. Piso in the dead body of an epileptic person found a watery col-

collection of this kind ^c, especially towards the hind part of the head. Drelincourt dissected the heads of several epileptic children, and found the interior ventricles of the brain turgid with an acrid yellow serum: in a drunkard, who died of the epilepsy, he saw a large collection of yellow serum between the dura and pia mater. Poupart ^f, in the body of an epileptic young man, observed a white thick phlegm between the skull and the dura mater: at the same time the dura mater, which was swelled, and moistened with the same kind of phlegm, could hardly be distinguished from it, nor did it seem to adhere to the cranium except by means of that phlegm. Nay, Hippocrates ^g seems to have looked upon this phlegm as the only cause of the epilepsy; and has pronounced this tedious disease therefore incurable, because the brain is eroded and melted down by the phlegm rendered acrid by stagnation.

Bony excrescences of the inside of the cranium.] It was said before, in the comment to §. 549, where we treated of the Diseases of the Bones, that sometimes those bony tumours are produced from latent causes: if this happens in the inside of the skull, the brain will be compressed by such an exostosis; and if this excrescence happens to protuberate in a point, it easily appears what violent complaints must thence be produced. I once saw a skeleton of this kind, in which almost all the bones were rough with those acute bony prominences; and the same was likewise observed in the cavity of the skull. In the body of a young man, who had laboured under the epilepsy for eighteen years, De La Motte ^h saw the dura mater, in that part where it forms the falx, rough with such bony spicula; which were so prominent, as to be able to hurt and prick the pia mater. This extraordinary observation he transmitted to the Royal Academy of Sciences ⁱ. He found also, in the same body, the

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^c Observ. et Consil. de Morbis a Serosa Colluvie, sect. 2. part. ii. cap. 7. p. 159.

^f Acad. Royale des Sciences 1705. Hist. p. 62.

^g De Morbo Sacro, cap. 3, 4, & 6. Charter. Tom. X. p. 478. et seq.

^h Traite Complet de Chirurgie, Tom. II. p. 368. ⁱ l'An. 1711. Hist. p. 36.

ventricles of the brain full of extravasated serum. The famous Hunauld found in an adult, who was likewise epileptic, bony spicula of the same kind below the upper longitudinal sinus, which had pricked the brain^k. And in the body of a young epileptic person, there was found, even within the cerebellum itself, a bone of an irregular figure, which was an inch long, and half an inch broad^l.

Depressions of it.] The cavity of the cranium is always naturally full; whence, upon opening it after death, the bones cannot easily be adapted to one another again, because the brain, being freed from the bone which confined it, rises up: while therefore the cavity of the skull is diminished by a depression, the brain is compressed; whence both the epilepsy, and several other complaints, may be produced; as was said in the comment to §. 267.

The venous sinuses rendered cartilaginous.] That the functions of the brain may be properly performed, there is required a free passage of the humours through the arteries, and a return of them by the veins. But the venous sinuses are a kind of receptacles, in which the blood may be collected, and retained, at least for some moments, while by coughing, laughing, or any violent effort, the free motion of the blood from the right ventricle thro' the lungs is hindered, by which means the jugular veins cannot readily empty themselves; wherefore those sinuses ought to be capable in some measure of being stretched. If therefore they are hardened into a cartilage, being thereby rendered inflexible, they cannot yield to the distending blood; and at the same time the substance of the sinuses, being changed into a cartilage, usually grows thicker, and on this account also the cavity of the sinuses is lessened: thus, by both these means, the ready return of the venous blood from the brain is disturbed. Such impediments to the return of the blood from the head, have been found in the dead bodies of persons subject to the epilepsy^m.

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^k Ibidem, l'an 1734. Hist. p. 59, 60. ^l Ibidem, l'an 1737. Hist. p. 71. ^m Bonet. Sepulcr. lib. i. sect. 12. Tom. I. p. 283, 292.

Fragments, or points of the bones, &c.] For if sharp bony spicula, arising from the processes of the dura mater, by irritating and pricking the brain, are capable of producing an epilepsy, as was said very lately; the same thing will happen, if after wounds, or violent contusions of the head, sharp fragments of bones, or parts of wounding instruments left sticking in the place, occasion the like irritation. But of these we treated in the history of Wounds of the Head.

Quicksilver, &c.] It is very well known, that quicksilver easily enough enters the bibulous mouths of the veins which open upon the external and internal surface of the body, especially if it is divided into very minute particles. Those persons experience this who are employed in gilding of metals, and by fire dissipate the quicksilver, which they make use of in gilding, into air: For by this means the mercury, being so divided by the fire as to be suspended in the air, is conveyed into their lungs, and they are frequently seized with a trembling of the joints, the palsy, and epilepsy. The same complaints happen to those who are employed in quicksilver mines, and especially to persons who by the force of fire separate the quicksilver from its glebe. After the cure of the venereal disease was first attempted by mercurial ointment, and a great quantity of the ointment was often imprudently applied by quacks, it was found by numerous observations, that the same complaints happened to those wretched patients as are above related. Nay, it appeared, that quicksilver, mixed with the circulating humours, produced a surprising change in the body (concerning which we shall speak afterwards in the chapter of the Venereal Disease); and often, likewise, escaping out of the vessels, was collected, and stagnated in the cellular recesses of the bones, and there by its weight pressing and overstretching the sensible membranes has produced very troublesome pains, which remained obstinately during life. Thus Mathiolus ^a has observed, that from the rotten bone of the leg of a person who had undergone a course of

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^a Aphrodisiac, p. 168. B.

unction ten different times by quacks, quicksilver flowed out oftener than once. I have several times seen bones of the skull of this kind, in the diploë of which globules of quicksilver manifestly appeared. Neither is it impossible that the quicksilver may be thrown out in the cavities of the brain itself, and produce very great mischief. But as the epilepsy has frequently enough been observed to follow upon the imprudent application of quicksilver, and in persons who were never before subject to this disease, and in whom no other cause of the epilepsy could on the strictest examination be discovered, it appears that this cause of the disease ought likewise to be numbered with the rest.

The brain hurt by inflammation, &c.] Those causes which have hitherto been mentioned in this number are all such as by irritating, eroding, &c. hurt the brain, and produce this disease. But an inflammation is capable of producing the same effect, as easily appears; and therefore in §. 774. convulsions are reckoned amongst those complaints which usually follow the worst kind of Frenzy; and in the comment to §. 775. it was observed, that in bodies who had died of that disease, there were not only inflammations found within the cranium, but likewise the consequences of inflammation, *viz.* abscesses, mortifications, and corroding acrid liquors; each of which was sufficient to produce an epilepsy before death. If good pus, gathered under the cranium after a violent contusion, was capable of producing a very strong epilepsy, which was immediately relieved when by trapaning the skull a vent was given to that liquid^o, it may easily be understood, that putrid sanies, which is much more acrid than pus, ought to produce still more violent effects. But that pus was lodged between the cranium and the dura mater; and therefore could only hurt by pressure from its bulk, or by irritating those parts, as it did not yet penetrate to the substance of the brain itself. If therefore a caries should be produced in the bones of the cranium, the corrupted sanies
oozing

oozing from the affected bone upon the membranes of the brain may occasion an epilepsy. A case of this kind is related by Bonetus ^p of a young man, who, after having suffered a severe head-ach for a long time, was seized with a violent epilepsy, the third paroxysm of which carried him off: upon opening the skull, the os occipitis was found carious near the cerebellum, but so as that the external lamina of it still remained entire; whence, upon the skull's being laid bare, there was nothing amiss to be discovered on its external surface. If the epileptic paroxysm is renewed by bad smells, as Aretæus ^q remarks, how much readier must this happen from that worst kind of corruption of a carious bone immediately affecting the brain itself, while this putrid substance is confined within the bony plate of the cranium, so as to be incapable of venting itself outwards. But venereal gummata usually corrupt the bones, which they affect, with a caries; or, if they are situated within the cranium, they may hurt the brain, by pressure from their bulk: of which we shall speak hereafter under the Venereal Disease. But black bile, dissolved and put in motion, if it arrives at the brain, as at the same time it is endowed with great acrimony, frequently produces this disease. An epilepsy from this cause is of the worst kind, and for the most part suddenly mortal, as will appear afterwards in the comment to §. 1104.

But these causes are assisted by whatever, &c.] But these causes hitherto mentioned do not always suppose this disease to be present, at least not all of them; for there is an interval between the epileptic paroxysms, and, as was said before, frequently a pretty long one. Wherefore that predisponent cause remains, although it does not renew the paroxysm, unless it is either increased, or another new cause supervenes, which joined to the former produces the epileptic fit. But we see, that the ancients formerly were acquainted with that latent epileptic disposition, which may lie long unactive, and then discover itself unexpectedly. Hence
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^p Sepulcret. Anatom. lib. i. sect. 12. Tom. I. p. 273.

^q De Causis et Signis Morbor. Acutor. lib. i. cap. 5. p. 1.

a legislator^r ordained, that it should be lawful for the purchaser to return the slave which he had bought, not knowing that he was subject to this disease: and as in other latent diseases, not commonly known, the space of six months was allowed for returning him, a whole year was granted in case he was afflicted with the epilepsy; for it was very well known, that this disease had sometimes such long intervals between the paroxysms. It may appear perhaps less just to physicians and masters of academies, that the law should have denied them this right to return the slaves which they had purchased, looking upon them as capable of discovering that latent disposition by their art and experience; when at the same time it is certain, that the most skillful physicians may be deceived in this affair, seeing in those who are long free from the paroxysm, frequently no sign of any disease appears in the interval. But it seems to have been a custom, formerly, for those who purchased slaves to try them with the smell of the jet stone, in order to discover whether they were subject to the epilepsy. Aretæus^s has remarked, that by this stench the epileptic paroxysm was excited; and Apulius, who was accused of magic, in pleading his own cause has the following observation: “ But if I
“ wanted to throw down an epileptic person in a fit,
“ what need could there be for a charm to do it?
“ seeing the jet stone when it is burnt, as I read in
“ physical authors, discovers this disease effectually;
“ and by the smell of it they commonly try the health
“ of the slaves in the markets^t.”

It was already observed, that the epileptic paroxysm would return in such as were predisposed to this disease, if the quantity of the humours, or their impulse towards the head, happened to be increased; which is chiefly occasioned by the following causes.

A plethora.] What a plethora is, and the signs by which it is known to be present, we shewed before in the comment to §. 106. In the comment to §. 1010. N^o I. the reason was given, why a plethora disturbs

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^r Plato de Legibus, lib. xi. Tom. II. p. 916.

^s Loco citato.

^t Apolog. Prim. pro se ipso, Tom. II. p. 169.

the functions of the brain particularly. While bony spicula, arising from the dura mater, prick the pia mater, and the brain underneath, they ought to hurt so much the more as the pia mater is the more turgid by its vessels being distended with blood. But in the cortex of the brain there is naturally no red blood: hence, in a plethora, the blood-vessels of the pia mater are chiefly distended, and so much the more strongly pressed by their protuberant points; whence a wretched epileptic person was relieved by plentiful bleeding, whereby the empty vessels subsided ^u. Neither does a plethora act only as an exciting cause; but it seems likewise sometimes to produce of itself the most violent epilepsy, and suddenly mortal. Drelincourt ^v saw a case of this kind, in a young nobleman, about eighteen years of age, of an athletic and plethoric habit of body; for after having dined plentifully, exercising himself by playing at ball, he fell down epileptic, and bled copiously at the nose: but although the most effectual methods were tried, he died after repeated paroxysms in the space of sixteen hours. The blood-vessels of the brain were found to be very cold, and blood extravasated in the cavity of the cranium.

Motion, heat, &c.] By violent motion of the body, or the heat of the air increased, we see evidently all the blood-vessels more distended; although the quantity of blood is not augmented by the motion or heat, but the humours are rarefied: hence these causes may produce the same effect as too great a quantity of good blood in the plethora. It is very well known, how much the blood-vessels are distended in persons who are drunk; and that a mortal convulsion is produced from drunkenness alone, unless a fever comes afterwards, has been remarked by Hippocrates, as we observed upon another occasion in the comment to §. 558: It is no wonder, therefore, that in those who are predisposed to the epilepsy the paroxysm should be thereby renewed. Nevertheless epileptic persons are fre-

^u Acad. Royale des Sciences, l'annee 1734. Hist. p. 59.
 Sepulcret. Anat. lib. 1. sect. 12. Tom. 1. p. 294.

^v Bonet.

frequently fond of strong liquors; because, when they recover from the fit, they find themselves weak and languid. But eating too plentifully is hurtful on a double account, both because the quantity of the fluids is suddenly increased by means of the crude chyle mixed in too great plenty with the blood; and because, the stomach being very much distended, the blood-vessels of the upper parts of the body are rendered more turgid; as was explained upon another occasion in the comment to §. 1010. No III. 1. Whence likewise it frequently happens, that epileptic persons disgrace their annual festivals by falling into a fit; and afterwards being ashamed, they shun the company of their acquaintance, and fall into the worst kind of melancholy,

Venery.] If we consider what happens to a man in the time of coition, it seems to bear some resemblance to the epilepsy. The erector muscles of the penis are swelled without the command of the will: nay, in some they often grow rigid against their will; while in others, who would grudge no cost to have it otherwise, they remain flaccid: the semen likewise is expelled with a downright convulsion^w; and at that time the sight becomes dim, (hence the poets have said, *putres in amore ocellos*, “that the eyes become blind “in love;”) and soon after the whole body becomes relaxed and languid; so that the fiercest bull, almost raging mad with lust, after coition becomes languid, tame, and tractable. As frequently paroxysms of the epilepsy hurt all the functions of the brain, and at last entirely abolish them by a fatal apoplexy; so also the like effects are produced from immoderate venery, as appears from a great number of practical observations. Nay, an apoplexy has been observed to follow from the imprudent use of lawful venery^x. But this is most to be dreaded by those persons who were before subject to this disease; and I have known it happen, that such a person has disgraced his nuptial enjoyment by an epileptic paroxysm. Wherefore the ancients have said

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^w Vide H. Boerh. Institut. Medic. §. 657.
Med. obs. 18. p. 176.

^x Heers Observ.

not without reason, *την συνουσιαν ειναι μικραν επιληψιαν*, “that
 “coition is a gentle epilepsy.” Aulus Gellius, who
 expresses himself as follows, will have the above to be
 an observation of Hippocrates: “But Hippocrates, a
 “man of the greatest understanding, had this opinion
 “of coition, that it was a slight degree of a violent
 “disease which we call the *falling-sickness*.” But I
 do not remember to have found this in Hippocrates,
 at least not in his works which are transmitted down
 to us; and Galen^z mentions that this observation was
 given to Democritus.

An acute penetrating genius.] It is certain, that all
 those causes which manifestly and considerably hurt
 the brain, or its membranes, are capable of producing
 the epilepsy, even in those who live in the dullest coun-
 tries, and breathe the thickest air. But such as enjoy
 remarkably acute parts, seem to have the common sen-
 sory so disposed, as to be more easily disturbed by the
 like causes, even though they are more gentle. Phy-
 sicians observe, that the liveliest girls are most frequent-
 ly liable both to this disease and hysterics; and in men
 the fittest to undertake great actions, and most conspi-
 cuous for learning, that disease has most frequently
 been observed. It will be sufficient to mention a few,
 but those of the greatest names. “*Julius Cæsar* en-
 “joyed a good state of health; except that in the latter
 “part of his life he used suddenly to faint away, and
 “likewise to be frightened in his sleep. He was also
 “twice seized with the epilepsy when he was engaged
 “in business^y.” It is imagined that *Petrarch* was
 likewise subject to this disease^b. *Fabius Columna*^c
 owns of himself, that he was troubled with the epilep-
 sy; and therefore he consulted the writings of the an-
 cient physicians, that he might see whether what his
 physicians ordered for the cure of the disease was back-
 ed by the authority of the ancients: But he relates
 that he was cured of it, by using the root of wild va-
 lerian.

^y Noct. Attic. lib. xix. cap. 11. p. 465.
 lib. iii. Epidem. Charter. Tom. IX. p. 27.

cap. 45. p. 59.

^b In vita, præfixa ejus operibus.

^c In Præfationi Phytobasani.

^z Comment. 1. in

^a Sueton. lib. i.

^c In

lerian^d. The very learned *Francis Redi* was epileptic during the latter part of his life^e, and was found dead in his bed one morning when he was upwards of seventy.

Profound meditation.] All those who apply themselves to study, know by experience, how much the head is affected, after poring a long while attentively upon the same subject, especially in the abstract parts of the mathematics: as likewise when they search after any thing that is hid as it were in the inmost recesses of the memory, which they are conscious they knew before, and cannot then call to mind. I have seen a very great man, who had lost his health by too much study, immediately seized with a troublesome vertigo, if he only listened attentively to others while they were telling a short story. He complained there was nothing happened to him that was more disagreeable than when he wanted to call any thing to mind: for then he was very much distressed; nay, sometimes fell into a swoon, with a sense of excessive fatigue: neither could he leave off the search after he had once begun it, although he strove to do it as much as possible; for he was forced to continue it whether he would or not, till he fainted away. Thus Galen^f observed in a young school-master, that he was taken with the epilepsy, as often as he fatigued himself with teaching, thought attentively, or was put into a passion. Thus I have several times seen, and been very much grieved at it, the most hopeful boys fall into an incurable epilepsy, while their rigid school-masters forced them to apply to their studies without intermission; and while they flattered the credulous parents with the vain hopes of the extraordinary learning of their children, they often effectually counteracted that purpose by rendering their unhappy scholars epileptic, and sometimes dull and silly during life.

Violent passions.] What sudden and powerful changes passions of the mind may produce in the body, was said before in the comments to §. 99, and 104: at

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^d Ibid. p. 120.^e In vita, præfixa ejus operibus, p. 10.^f Lib. v. de Locis Affectis, cap. 6. Charter. Tom. VII. p. 492.

the same time it appeared, that all the functions of the body may be disturbed by those passions; but especially those which depend upon the brain. Wherefore it is not at all surprising, that the latent epileptic disposition should by these be roused, and forced into action. When a person is put into a violent fit of anger, the face becomes red and swelled, the eyes blood-shot, and the pulse stronger and more quick; all which signs demonstrate the celerity of the humours, and their impulse towards the head, to be increased: hence the young school-master, who was mentioned above, was seized with the epilepsy while he was angry. I have frequently seen the same thing happen both from sudden joy and grief.

Strong force of imagination.] It was said before in the comment to §. 700, where we treated of Delirium in Fevers, that *imagination* is the perception of an idea produced by an *internal* cause, from a physical change of the immediate organ of sensation or the common sensory: for when an idea is produced from an *external* cause acting upon the senses, then it is called a perception of the *senses*. Man possesses this wonderful faculty, that by imagination he can call before him as it were a thing that is absent: nay, he can even excite new ideas of things which never existed; while, for example, he calls up a chimera in his imagination. As, therefore, the other functions of the mind are not exercised with the same facility in all persons, but in some there is observed a greater acuteness of understanding, a stronger memory, or a more accurate judgment; so likewise in some persons this force of imagination is greater than in others. This is cried up in painters and statuaries, who, by their ingenious art raise the same idea by means of the senses in other persons, as they had conceived in their own imaginations themselves: the enthusiasm of the poets likewise owes its origin to a strong imagination. When therefore the force of imagination is very great, and especially when a person leading a solitary life is seldom or not so sensibly affected with external objects; then an idea, produced by the imagination, frequently changes the com-

mon sensory more than other ideas produced from the perception of the senses: and while at the same time the common sensory is so changed in another manner than ever happened from external objects, new and unusual ideas arise in the mind, the causes of which they believe to exist without themselves, and actually imagine that they have seen revelations and a great many other surprising things. But if to the ideas thus raised by their imagination, that grateful or ungrateful circumstance is joined (see §. 700.), then there frequently follows an insuperable perturbation of all the animal functions. Whence it appears, why such a lively imagination is so hurtful to those who have a tendency to the epilepsy: nay, we observe sometimes in the beginning of the epileptic paroxysm, or a little before it comes on, that such new and unusual ideas are excited; seeing they imagine that they perceive very beautiful colours, which they never saw before; very agreeable sounds; unusual smells, either grateful or detestable; and are sometimes angry, while they fancy that their head is struck sily with a stick or stone^g. We see likewise the signs of fear stamped on the countenances of some when they fall down; and in others, on the contrary, the face is observed to be inclined to smile: all which seem to confirm, that then new ideas arise from an internal cause acting upon the common sensory. A young man imagining a spectre had jumped upon his shoulders, and that he carried it home with him, was taken ill upon it; and the imagination of a spectre of the same kind being renewed, he became epileptic^h.

Fear, and especially a sudden fright.] Perhaps there is no cause that has produced this disease more frequently, or more often incurable, nay, and sometimes suddenly mortal. I have known a great many rendered epileptic, and they remained so during life, from another epileptic person falling down in a fit before them; and there are a great many such cases to be met with

^g Aretæus de Causis et Signis Morbor. Acutor. lib. i. cap. 5. p. 2.
^h Fred. Hoffmann, Med. Ration. System. Tom. IV. part. iii. cap. 2. obs. 4. p. 82.

with amongst physical writers. Schenckiusⁱ grievously laments, that his beloved spouse, of a strong healthy constitution, died in the last month of her pregnancy, together with the foetus, while, a fire breaking out in the neighbourhood, she beheld the flames and sparks flying through the air, and dispersed all round, from a window in the upper part of the house: for she was thereby seized with such a violent epilepsy, that she expired in twelve hours, by the frequently repeated paroxysms. There was nothing morbid before in this lady's constitution; the violent and sudden fright alone was the occasion of the disease.

But the epilepsy, arising from a fright, usually renews its paroxysms chiefly at those times when the like idea occurs as that which first excited the disease. A boy was so frightened by a large dog jumping upon him, that soon after he fell down epileptic; and afterwards, upon seeing a large dog, or even hearing him bark, the paroxysm returned. Whence we learn, what a trifling matter is sometimes sufficient to rouse that latent epileptic disposition afresh into action. I have seen a person, who, after having frequently taken a nauseous purging draught, upon seeing the cup out of which he took the physic, not only shuddered, and became squeamish, but likewise had several stools: thus the sole idea of a nauseous remedy being renewed, supplied the place of a purge, and disturbed the whole body. Do not little marks or letters, having nothing common with the things which they denote, renew in us those ideas which we had several years before and which have slipped out of our minds? nay, and from this cause alone strong affections of the mind, viz. anger, hatred, melancholy, &c. are frequently renewed which had lain long quiet. In like manner the epileptic paroxysms seem to be renewed in those, who were thrown into this disease by a violent fright. Whence Galen remarking those things which were to be shunned by the epileptic boy, to hinder the paroxysm from returning, seems to have very judiciously cautioned him—*A quibus corpus vehementer moveri et*
per-

perturbari solet, atque in remiscientiam morbi referri
 (ἢ ἢ παθὺς ἀναμνησαί) *et ad generationem paroxysmi deduci;*
 “ From whatever things the body used to be violently
 “ moved and disturbed, the disease is called to mind,
 “ and a paroxysm produced^k.” For there he beautifully
 compares the returning paroxysm to the memory of
 the epileptic disposition, which was before quiet, be-
 ing as it were renewed.

4. Those causes, which were mentioned in the
 preceding number, had their seat in the brain itself,
 and hence the whole nervous system was so surpris-
 ingly disturbed. But that the brain can be so disturbed
 by a change brought upon the nerves in different parts
 of the body as to occasion an epilepsy, appears from
 certain observations. Whilst, by gently tickling the
 soles of the girl before mentioned, a change was
 brought upon the nerves very distant from the brain,
 the epilepsy was produced. Schenckius^l relates, that
 a boy was rendered epileptic by being surpris-
 ed with the noise of trumpets, and died in ten hours after. It
 was said before in the comment to §. 364. where we
 treated of Luxations, that sometimes the worst con-
 vulsions happened when a reduction was attempted
 while the part remained strongly inflamed: nay, it
 appears from the observations of Hippocrates, as was
 remarked in the same place, that some luxations ought
 not to be reduced, especially if the luxated bones start
 out of the wound which is made; because, after they
 are reduced, the patients die convulsed. From which
 it appears, that violent affections of the nervous system,
 though arising from causes distant from the brain, may
 produce the epilepsy: but that such was really the
 case appeared from what followed.

Great and periodic pains.] That great pain produces
 convulsions, was proved before in the comment to
 §. 226: if therefore such violent pains recur perio-
 dically, from this cause epileptic paroxysms may be
 produced.

It is well known, that an epilepsy has taken its rise
 from

^k Confil. pro puero epilept. cap. 2. Charter. Tom. X. p. 288.

^l Observ. Medic. lib. i. p. 100.

from calculi, for example, irritating the pelvis of the kidney, the ureters, or bladder. A girl of twelve years of age was suddenly seized with an epileptic fit, and in two years time died; the paroxysms returning frequently and violently: when she was opened, there was nothing found in the head that could be looked upon as the cause of the disease; but in the pelvis of the right kidney there was lodged a triangular stone, weighing five drachms^m. It is very true, as will afterwards be noticed, that the causes of the epilepsy are sometimes so concealed, that even the most skilful persons have confessed, that in the bodies of those who are subject to the epilepsy, examined with the greatest care, they could not discover any thing to which the disease could be imputed; and therefore, it might, not without reason, be doubted, whether that calculus ought to be looked upon as the cause, or whether there might not be some change brought upon the brain, sufficient to produce the disease, although it could not be discovered by the senses: But in the same author there is another observationⁿ, of a girl about the same age, and likewise epileptic, who, after a violent paroxysm, having voided five stones, was freed from the disease; and therefore it appears probable, that in the former case the disease was produced from the like cause. But it is very well known, that calculi do not always produce the same disturbances; but affect the body differently, as they are propelled into the ureters, or are more angular, and pass with more difficulty, &c. and therefore from such a cause periodical epileptic paroxysms may be excited.

The hysteric passion.] It was remarked before in the comment to §. 633, where we treated of the spasmodic anxiety, that in some persons the whole nervous system is so delicate, that violent convulsions arise from the slightest causes. This, in men, is called the *hypochondriac disease*: but, in women, it is denominated the *hysteric passion*; because a great many have believed, that all those complaints depend upon the uterus; nay, that the uterus, being moved from its place, ascended up-

upwards. But such women, who are frequently healthy enough in other respects, being provoked to anger, or frightened, begin to breathe with difficulty, and have the motion of the blood through the vessels disturbed, with a palpitation of the heart: not long after, they feel something as it were moved and turned round about the hypogastrium, ascending for the most part in the left side; and when it gets as high as the diaphragm, then they feel as if they were suffocated, and perceive a very troublesome stoppage in the throat; nay, sometimes it evidently appears that the œsophagus is distended: soon after, they fall, and are often violently convulsed. This is that *πνεξις ὑστερική*, or *uterine suffocation*, as it was called by the ancients. But as they feel the motion of a ball ascending as it were in the abdomen, (by binding which part with a roller, before it ascends to the diaphragm, they are sensible of relief); as they also perceive the sense of a ball in the fauces, which suffocates them; and as these hysterical paroxysms frequently return about the time of the menstrua; thence they conclude, that it is the uterus which ascends in this manner, or at least that the cause of all these complaints are lodged in the uterus. It cannot indeed be denied, that corrupted humours, collected in the cavity of the uterus, or lodged in the vessels dispersed through its substance, by eroding or irritating this nervous part may produce the worst complaints: But when there is no ichor discharged from the uterus; nor any symptoms indicating the presence of an inflammation, ulceration, or schirrhous, &c. in that part; and those commotions are excited by the affection of the mind only; and that the same symptoms are sometimes observed in men; it easily appears, that the uterus cannot be looked upon as the absolute and only cause of the hysterical passion: but all the symptoms teach us, that such extraordinary motions are excited in the nerves dispersed thro' the abdominal viscera, which afterwards disturb the whole brain, and produce the strongest convulsions; as will appear to be the case in what follows, if the nerves are affected in the same manner in other parts of the body.

But

But sometimes it happens, that in the time of the hysteric paroxysm the person is sensible, hears, and understands every thing, and when the fit is over feels no stupidity remaining, neither does any foam appear at the mouth: then it is usually called the *hysteric* or *hypochondriac* passion, and not the epilepsy; because, according to the definition given at §. 1071, in a true and perfect epilepsy the internal and external senses are abolished. In the mean time these diseases are very much akin to each other, and the hysteric passion has frequently been observed to degenerate into the epilepsy. Sydenham (see §. 633.) has reckoned a plentiful discharge of limpid urine, which usually precedes a paroxysm of this disease, the pathognomic symptom of the hysteric passion, which frequently mimics all other diseases: But Hippocrates remarks the following: *A more than ordinary discharge of thin and crude urine, without repletion, in persons who are epileptic, prognosticates a paroxysm of the disease*°. Where he judiciously takes notice, that then only it foretels an epileptic fit, if “it is in greater quantity than usual, “and without repletion;” *præter morem, et absque repletionem fiat*. For there are persons, and some such I know, who are accustomed to make great plenty of urine, limpid like water, even while they are ill of acute diseases: and after drinking plentifully of any thin watery liquor, such kind of urine is always voided. But in hysteric and hypochondriac persons, as soon as the nervous system begins to be disturbed by the affections of the mind, or any other cause, such a limpid, inodorous, insipid urine, is frequently voided to the quantity of some pounds; and soon after, anxieties and convulsions follow. Hence the hysteric passion is justly classed among the causes of the epilepsy.

Erosions, and irritations from worms.] Of worms, and a great many disorders which have been observed to arise from them, we shall treat afterwards in the com-

° Epilepticis urinæ tenues et crudæ, præter morem, sine repletionem, morbi invasionem significant. *Coac. Prænot. No 599. Charter. Tom. VIII. p. 887.*

comment to §. 1360, in the chapter of the Diseases of Infants. It is sufficient here to observe, that while, by creeping upon the intestines or stomach, they irritate those parts, or hurt them by gnawing, they frequently produce the epilepsy. In a boy of two years old, and of a very good habit of body, who died of violent and continual convulsions, the duodenum was found perforated by a round worm, which was taken alive out of the body^p. When Marchant^q, by the advice of Fabius Columna, gave the root of wild valerian to epileptic persons, he was of service to a great many; and by this remedy worms were expelled by the anus.

Teething, an acrid humour, &c.] In childhood the brain, and the nerves arising from it, are greater, in proportion to the other parts, than in adults, and are likewise very much irritated from slighter causes. Hence, whatever affects the senses strongly and suddenly, as a great noise, strong light, or acute pain, produces epileptic convulsions in young persons; and there is hardly one amongst a hundred, who has not suffered something of this kind in the first stage of life, although he continues free of it ever after. But this is chiefly to be feared in the time of teething, when the gums being tense, and frequently inflamed, are gradually torn by the tooth emerging from the socket, and thus occasion great pain; and it especially happens while the eye-teeth are cutting, which, being thicker, and having an obtuse point, pierce the gums with difficulty. Hippocrates^r has remarked this, where he mentions the chief diseases in various ages. But as such a cause producing the epilepsy must cease as soon as the tooth has made its way, the gum may be safely divided with the lancet in such a case: hence Hippocrates in another place has said, *Children who are convulsed from teething do not all die, but even many of them escape*^s.

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^p Bonet. Sepulcret. Anat. lib. i. sect. 13. Tom. I. p. 331. ^q Acad. Royale des Sciences, l'an 1706. Mem. 430. ^r Aphor. 25. sect. 3. Charter. Tom. IX. p. 120.

^s Non omnes a dentibus convulsi intereunt, sed et multi sospites evadunt. *De Dentitione*, n^o 11. Charter. Tom. VII. l. 371.

The same thing is to be feared in infants, if the stomach or intestines are irritated by any thing acrid, which is frequently observed to happen in such as are new-born, from the meconium being retained, and afterwards from the milk becoming acid in the stomach and intestines; concerning which we shall treat afterwards in the chapter of the Diseases of Infants.

The infection of the small-pox.] Repeated observations teach us, that while the body is oppressed, or irritated by an unusual acrid stimulus, strong convulsions frequently follow, by which that which oppresses or irritates is either expelled, or thrown upon other parts of the body where it is less hurtful. If the stomach is loaded with disagreeable dregs of the aliments, or inert phlegm fluctuates in it while it is almost empty, there arises a squeamishness and vomiting, by which that viscus is freed of its load and irritation. But it was proved before, in the comment to §. 642, 652, that vomiting and squeamishness have for their immediate cause a convulsion of the muscular fibres of the fauces, œsophagus, stomach, intestines, diaphragm, and abdominal muscles. If any thing acrid gets into the eyes, the orbicular muscles of the eye-lids are immediately convulsed, nor can the eye-lids be separated till after a copious discharge of tears the acrid body is either weakened or washed out. The same appears in coughing and sneezing, while the inside of the nose or the internal surface of the wind-pipe and its branches are irritated. Whence Galen has said: *Comitialem morbum fieri, nervorum principio se ipsum quatiente, ut, quæ noxia sunt, excutiat*; “That
“ the epilepsy is produced, by the origin of the nerves
“ shaking itself to throw off whatever is noxious.” Wherefore Hippocrates likewise observes (as was said upon another occasion in the comment to §. 711.) That a convulsion in a fever is good, if it ends the same day; for then that which occasioned the fever is expelled by the convulsion. But, in the small-pox, it is frequently observed, especially in young persons, that

* Comment. 1. in lib. Hipp. de humor. ad text. 1. Charter. Tom. VIII. p. 515.

that a little before the morbid matter is thrown out upon the skin, an epileptic paroxysm is produced; and as soon as the small-pox appears, that symptom is quieted, and never returns afterwards: for I have known several, who near the time of the eruption of the small-pox, have suffered the epilepsy, and have remained free from this disease ever after. Nay, Sydenham^u, when he observed an epileptic fit in children, after the teething was over, always suspected that the small-pox was at hand; and then for the most part they were mild, and of a good kind. The same frequently happens before the eruption of the measles; and is often also observed in other diseases attended with cutaneous spots or eruptions, *viz.* in the miliary and spotted fever, &c. before the spots appear upon the skin: which, if they suddenly disappear, are followed by new epileptic paroxysms, till all the morbid matter is thrown out upon the surface of the body.

[The heart-burn.] The ancient physicians have called the upper orifice of the stomach, where the œsophagus is joined to it, the *καρδια*: hence they have named a troublesome and gnawing pain, which is felt about this part, *καρδιαγμον*, and *καρδιαλγίαν*; as was said before in the comment to §. 63. where at the same time it was remarked, that that orifice was much more sensible than the internal surface of the stomach. Helmont allowed this part to have such influence over the rest of the body, that here he placed the seat of the soul, and of Archæus, to whom he attributed almost every thing in diseases and their cures: whence, when that part is irritated, or eroded, either by worms, or an acrid humour lodged in the stomach, or is seized with an inflammation, it is no wonder that epileptic convulsions then follow. See also what was said in the comment to §. 953.

An ulcerous matter lurking in some part of the body.] While a purulent boil remains too long unopened, the pus, being rendered more thin and acrid by stagnation, is resorbed into the veins; and may

produce the worst effects; (see comment to §. 406.) I saw an epilepsy produced from such a cause, *viz.* from pus deposited in the brain by an unfavourable metastasis, the very first paroxysm of which proved mortal. There has likewise been observed a chronical epilepsy, very troublesome by its frequent repeated paroxysms, which arose from a carious great toe ^v: and we read in Schenckius ^w, that an epileptic person was cured, when upon opening a tumour in the hip by means of a cautery, and at the same time removing the bone which was carious, the ulcerated part was well cleansed from a putrid sanies.

Hunger, surfeiting, &c.] It has already been demonstrated in several different places (see §. 229, 700, 710), that all the functions of the brain may be surprisingly disturbed by such causes as are lodged in the stomach. Galen has very well remarked this; and at the same time has observed, that in some persons there is a greater weakness and sensibility of the stomach, and that such are therefore more subject to diseases of the head. He expresses himself as follows: *For thus the epilepsy is produced in some, from a weakness of the stomach; and the carus, coma, catalepsy, delirium, and melancholy, by the sympathy of the common sensory in the brain and nerves* ^x. Therefore elsewhere ^y he has distinguished the epilepsy into three species, according to the diversity of the part where the cause of the disease is lodged, *viz.* in the brain; or about the stomach; or in any other part of the body whence the patient is sensible of its ascending towards the brain, concerning which we shall speak below in the comment to n^o 6. The like observations are to be found in Ægineta ^z, Trallian ^a, and several other authors. Where therefore, after long fasting, the more acrid humours, especially the bile, easily regurgitating from
the

^v Bonet. Sepulcret. Anatom. lib. i. sect. 12. Tom. I. p. 294.

^w Observat. Medic. lib. i. p. 116.

^x Ita enim epilepsiæ ob stomachi imbecillitatem quibusdam oriuntur, et cari, et comata, et cataleptis, et deliria, et melancholiæ, consentientis principio, quod in cerebro et nervis est. *De Symptomatum Causis, lib. i. cap. 7. Charter. Tom. VII. p. 60.*

^y De Locis Affectis, lib. iii. cap. 2. ibid. p. 443.

^z Lib. iii.

cap. 13. p. 29, versa.

^a Lib. i. cap. 15. p. 63.

the duodenum to the flaccid and empty stomach, wash this viscus; or a crapula loads it with too great a quantity of aliments, rendered acrid by stagnation and spontaneous corruption; or acrid, aromatic, saline, &c. foods, are taken in such a quantity as to erode and irritate the sensible parts; an epilepsy may follow. Galen^b observed in the young school-master, that, whenever he fasted too long, he was seized with an epileptic fit: and when afterwards, being cured by Galen, he enjoyed a perfect state of health, yet he was subject to a slight convulsion, if his business obliged him to fast longer than usual. He farther adds, that he had likewise seen others, who would fall down epileptic, if they happened not to have digested their aliments sufficiently, or had drank too great a quantity of rich wine, or had given too great a loose to venery.

But that acrid medicines and poisons, by eroding the stomach, have occasioned violent convulsions, appears from numerous observations, to be met with almost every where; wherefore I shall not dwell long upon them. We see from several places of Hippocrates, that he had observed this complaint to arise from hellebore: hence he is very full in relating the cautions which are requisite towards giving that generous remedy safely; and at the same time advises what is to be done in case convulsions happen after taking it.

But there are other poisons besides, in which no great acrimony can be observed, which nevertheless being lodged in the stomach produce the worst kind of epilepsy. The roots of water-hemlock by their sweet taste have allured children to eat them: upon which a terrible epilepsy has followed; neither did any of them escape alive, except those who either spontaneously, or by the assistance of art, vomited up that noxious poison; as I have remarked from Wepfer^c, upon another occasion, in the comment to §. 229. Hence likewise the reason appears, why sometimes vomits,

^b De Locis Affectis, lib. v. cap. 6. Charter. Tom. VII. p. 422.
493.

^c Cicut. aquat. histor. et nox. p. 5, &c.

by evacuating very acrid humours, have cured the like diseases; a memorable example of which we read in Willis ^d.

5. Repeated observations teach us, that frequently such things are expelled out of the human body, as would be hurtful, either by their quantity, or their vicious quality, if they were to remain in it; and therefore, if such wholesome evacuations have from any cause been hindered, an epilepsy has frequently followed. In very healthy young men, at that time of life when the vessels begin to yield with more difficulty to the impulse of the fluids, a salutary hæmorrhage of the nose is often occasioned, especially in spring and autumn. Such a periodical evacuation by the hæmorrhoids is frequently observed in adults, who eat plentifully, and at the same time lead a sedentary life. But if these evacuations are imprudently checked, very bad consequences are to be feared; and Hippocrates has made the following general remark upon them: *Those who void blood periodically, if, upon that evacuation being stopped, they become thirsty, costive, and languid, die epileptic* ^e. And elsewhere ^f he says, that the same is to be feared from a suppression of the menses. But by those periodical evacuations the quantity is only lessened of good blood; and a suppression of other evacuations, which carry off humours degenerated from a healthy state, is much more hurtful. Hence, while the blood stagnates in the cavity of the uterus after child-bearing, or in its dilated vessels, and becomes putrid by the air getting to it, nor is likely to be evacuated by the lochia, much worse complaints usually follow than from a suppression of the menstrua, as will afterwards be noticed more at large in the chapter of the Diseases of Women in Child-bed. For the same reason, a retention of the urine, by which the salts and acrid oils of the blood

are

^d Patholog. Cerebr. cap. 9. p. 135.

^e Qui statis temporibus sanguinem fundunt, siticulosi, difficiles, exsolvi, si non fuderint sanguinem, epileptici moriuntur. *Prorrheticor. lib. i. p. 793* Charter. Tom. VIII. et Coac. Prænot. n^o 345. *ibid.* p. 871.

^f Coac. Prænot. n^o 522. *ibid.* p. 883.

are naturally washed out of the body, produces diseases of the head; almost all, to whom this disease proves mortal, die sleepy and convulsed. But the danger is still greater, when the urine is suppressed in acute diseases; for then sudden convulsions are to be feared, as was said upon another occasion in the comment to §. 772, and confirmed by the testimony of Hippocrates.

But besides those evacuations, which are almost all natural, there are others observed, by which a morbid matter is evacuated, frequently in surprising ways; and from these being suppressed, an epilepsy is likewise threatened. Thus we see in infants the skin of the head ooze out a plentiful liquid, that frequently dries into pretty thick crusts, which, if they become too much hardened, hinder this evacuation, and produce epileptic paroxysms: and not only in the head, but likewise in the face, and even on the rest of the skin of the body, in the same manner, an acrid humour of this kind issues out, with a troublesome itching indeed, but for the most part of great service to the health, especially in fat children. I have frequently seen, when mothers, being tired with the troublesome task of dressing them, have dried up those sores of the skin by means of liniments made up with preparations of lead, a violent epilepsy has followed, which often proved soon mortal; or if the children escaped, a like cutaneous excretion returned either in the same places, or near them. Hippocrates, or whoever was the author of the book upon the Epilepsy which is usually reckoned among the works of Hippocrates, believed that the brain abounded with such a phlegm, which, if it was not purged off while the foetus remained in the uterus, ought to be expelled either by this or the other way; for else he was afraid that an epilepsy must follow. *In some children, ulcers break out upon the head, behind the ears, and all over the body; these, and such as drivel much, and void a good deal of mucus, after some time become very healthy: for here the phlegm, which ought to be purged off in the uterus, is evacuated; and such as are cleansed in this*
man-

manner, are hardly ever seized with the epilepsy. But those whose skin is smooth, and who neither have any ulcer, nor are troubled with mucus nor drivelling, nor have been purged in the womb, are in danger of being taken with this disease^g. Whence it appears, with how much judgment those eruptions of the humours by the skin in young persons ought to be treated. Nor can they be safely dried up, unless another evacuation is substituted in their room, for example by stool; and then too there is very great need of caution. In some, after they are grown up, a like evacuation continues, which being suddenly suppressed, sometimes affects the inside of the head, and produces the very worst complaints, and even death itself. Thus we read in Diemerbroeck^h, the case of a boy, of twelve years of age, who had been subject to a scald-head from his infancy: his mother being solicitous about curing this ugly complaint, by the advice of a quack made use of various lotions and ointments, and thus in a short time removed it: but a few days after he was seized with the head-ach; which, increasing daily, became at last almost intolerable, and would yield to no remedies: epileptic convulsions followed, which were at first gentle, afterwards became very violent and constant, and at last killed him. Upon opening his head, the whole dura-mater appeared red; and the upper part of it, towards the left side, blackish: upon cutting it, a blackish watery humour flowed out, which had been lodged between it and the pia mater. On the other hand, Tulpiusⁱ has observed, that in two children the epilepsy was cured by running sores of the head. I have several times seen in adults of both sexes, otherwise very healthy, in the spring-time, a redness appear
in

^g Quibuscumque pueris existentibus efflorescunt ulcera in caput, et in atres, et in reliquum corpus, et qui salivosi sunt et mucosi, hi ipsi progressu ætatis facillime degunt: hic enim abit et purgatur pituita, quam in utero purgari oportebat; et, qui sic purgati fuerunt, morbo comitiali fere non corripiuntur. Qui vero puri sunt, et neque glans ullum, neque mucus, neque saliva prodit, neque in utero purgationem fecerint, talibus periculum est, eos hoc morbo corripi. *De Morbo Sacro, cap. 4. Charter. Tom. X. p. 479.*

^h Observat Medic. n^o 60. p. 75.
cap. 8. p. 17.

ⁱ Lib. i. Observ. Medic.

in various parts of the face, with a sense of heat and itching: soon after, there was observed in the red skin some small foramina, which oozed out a kind of viscid humour, which soon concreting into thick yellow crust adhered obstinately to the skin. After some weeks these crusts fell off spontaneously, the skin acquired its natural colour afresh, and appeared as beautiful as before. I have observed the same thing to return in many people annually, disagreeable indeed to the eye, but without any hurt to the health: but when, being weary of this troublesome complaint, they made use of various remedies, either the eruption spread broader, and continued longer out; or, if it yielded to the remedies applied, troublesome complaints of the head followed, pains, giddiness, &c. till the wheals returned afresh; in order to which, I have seen fresh beet-leaves applied with great success. You may likewise see what has been said upon such cutaneous eruptions in the comment to §. 725.

I have also frequently observed in practice, the gouty matter, before it has been determined to the lower extremities, occasion a violent epilepsy; which has been cured by the first paroxysm of the gout, and never returned afterwards.

6. Galen has observed this cause of the epilepsy in his time, *viz.* when *the complaint begins in a certain part of the body, and the patient feels it ascending towards the brain*^k. Galen first saw this in a boy thirteen years old, he himself being at that time very young: the boy simply affirmed, that he felt the first beginning of the complaint in his leg; hence it ascended right up his thigh, groin, and sides, to the neck and head; and as soon as it had got to this last, then he was no longer sensible. Afterwards he saw another epileptic person, but older than the former, suffer the same symptoms; who said, that what ascended was in the form of a cold blast. Hence Galen compared the surprising cause of the epilepsy to the bites of venomous

^k A parte aliqua corporis incipit affectus, qui deinde, sentiente ægro, ad cerebrum usque ascendit. *De Locis Affectus, lib. iii. cap. 11. Charter. Tom. VII. p. 443, &c.*

ous animals: for as such bites, even when they happen in the tip of the finger only, disturb the whole body, so the same is produced from such an epileptic fomes: and as tight ligatures above the part bit, or cutting it immediately off, effectually prevent all mischief, by hindering the poison from spreading to other parts, so the same has been frequently observed in epileptic persons, as will be said afterwards in the comment to §. 1084. I have seen several such cases, and a great many of the same kind may be read amongst practical authors. Sometimes they have felt a cold blast ascend; sometimes they could determine nothing distinctly; in some a sensation was felt, as of ants creeping up under the skin: but this phenomenon obtains in almost all of them, *viz.* that that blast rises upwards. For that seldom happens, which Bonetus¹ affirms he had observed in a man of fifty, who had a swelling in his left groin at intervals; and then a creeping sensation was continued gradually over his whole leg to the sole, where, as soon as it arrived, it immediately was directed upwards, and attacked the brain. The patient would not suffer the physicians to destroy that epileptic fomes, by cutting, or burning; but immediately tied his leg tight with a fillet as soon as he perceived the first symptoms of the complaint, and thus prevented the paroxysms: but happening once not to be able to tie the ligature soon enough, he was seized with so strong a fit, that he died of the violence of the disease, which he had so often successfully suppressed.

§. 1076. **A**LL which causes of the epilepsy (§. 1075.) we learn from practical observations, and the dissection of dead bodies.

All that was said concerning the causes of the epilepsy in the preceding aphorism, was either confirmed by the observations and authorities of the best authors, or was seen in the bodies of persons who had been subject to this disease. For physicians have always
been

¹ Sepulcret. Anat. lib. i. sect. 12. p. 291.

been inquisitive, and very justly, concerning what physical change could be brought about in the brain of epileptics which could be reckoned the cause of this wonderful disease. But that cause is double, as was said before: one which produces the present paroxysm; and the other, which, during the time of the intervals, occasions a disposition of renewing the paroxysm. Sometimes there is nothing at all found which discovers any perceptible difference in the body of a person who has died of the epilepsy, from that of any other: sometimes there is something appears unusual in certain parts; and when this has been frequently found to appear in the same manner, then physicians have not unjustly argued, that such preternatural appearance, observed in most bodies of epileptic persons, may be reckoned as a cause of this disease. Willis ^a, than whom perhaps none has opened a greater number of skulls, candidly owns, that in the bodies of those who had died of the epilepsy, he frequently could find no sensible cause of the disease: in others he found a collection of serum filling all the cavities and recesses of the brain ^b. In the mean time, it likewise appears, from certain observations, that such a collection of serum has been found in the bodies of those who have died of other diseases of the head, without ever having the epilepsy, as may be read in Pifo *De morbis a serosa colluvie ortis*. It was remarked before, in the comment to §. 11. that the examination of dead bodies was extremely useful for discovering the latent causes of a disease: in the mean time, however, we ought always to be mindful, that in a dead body we find the parts in such a state as they were in a little before the person died; and sometimes those things which are found preternatural in it are the effects of the disease, and not the causes which produced it. It will appear in the comment to the following aphorism, what wonderful changes happen both in the fluid and solid parts of the body during the time of the epileptic paroxysm: wherefore these may likewise be observed after death; but they are some-

^a Patholog. Cerebri, cap. 4. p. 49.

^b Ibid. cap. 10. p. 164.

sometimes the effects of the epilepsy, and not always the causes : therefore whatever has been said concerning the causes of the epilepsy, ought to be understood with this restriction.

For it is certain, that the cause of the epilepsy may lie so concealed, as not to be discovered by the senses, but only to shew itself by its effects. When a person, being frightened by seeing one in the epilepsy, is seized with the same disease ; who would take upon him to guess, what change is then brought upon the body ? It was said before in the comment to §. 1071, that some are capable of counterfeiting the epilepsy ; and then at the command of the will they produce all those convulsions of the limbs, contortions, &c. : as soon as this command of the will ceases, all the other appearances are quieted, and not the least vestige remains of the cause, which was able to excite such great commotions. Hence we learn, that the human body is so formed, that the conscious and willing mind can act upon that corporeal organ whence the muscular motions depend, and so can excite those motions with such celerity that no sensible interval of time can be observed between the command of the will and the motions thereupon produced. But at the same time we know, that the body is obnoxious to this misfortune, That from other causes, often equally as little understood, the same corporeal principle can be so changed, that the like motions can be excited, nay and frequently stronger ones, without the mind being conscious or willing, as we shall presently see. Whence it appears, that sensible changes are not always to be found in the bodies of those who have died of this disease. Who will give a reason, why a lady of quality should be epileptic the whole time of her pregnancy while she was with child of a son, and not at all so when with child of a daughter ? But lest this should be imagined to have happened accidentally, she bore three sons, and was always epileptic till she was delivered ; and four daughters, without suffering the least from this disease during her pregnancy ^c.

§. 1077. **T**HE effects of this disease may be reduced, 1. To disorders of the brain, hurt by such violent and repeated convulsions; whence a failing of the memory, dulness, foolishness, palsy, apoplexy, death. 2. To disorders of the nerves and muscles; whence contractions, distortions, and deformities, of these and of the joints. 3. To violent spasms; whence inflammation, mortification, and blackness of the parts which abound in blood, especially of those placed above the muscles. 4. To certain secretions violently produced by the force of the paroxysm; as meat, drink, lymph, bile, froth, mucus, and saliva, discharged upwards; green stools, semen, and urine, downwards; and blood, both ways.

1. Although the procatactic causes of this disease should be observed in different parts of the body; yet, during the time of the paroxysm, the brain is affected, as was proved in the comment to §. 1074. No wonder therefore if the tender pulp of the brain be hurt, and sometimes destroyed, by so many violent agitations. Further, in the comment to §. 1073, where the various symptoms are enumerated which appear in the time of the paroxysm, it was said, that the jugular veins swelled by the free return of the blood from the brain being hindered, the face became livid, and the turgid blood-shot eyes protuberated; all which symptoms teach us, that the vessels of the head are very much stretched by the distending blood: and therefore, by the compression of the soft pulp of the brain, by the extravasation of the liquids from the ruptured vessels, by the expression of a more plentiful and thick kind of fluid from the finest exhaling vessels into the ventricles of the brain, and by the change of the diameter of the vessels which are too much distended, various complaints of the functions of the brain

may remain after the paroxysm is over; which Aretæus has enumerated, *viz.* “ A dulness of wit and
 “ stupidity of the senses. hardness of hearing, a ringing and noise of the ears, a faltering of the speech,
 “ a perturbation of the judgment, and at length idiotism^a.” Hence we see all epileptic patients, when they come first out of the fit, are dull, heavy, forgetful, and weak. While these complaints take their origin from the agitation of the brain alone, and the greater distension of the blood-vessels, they usually diminish by degrees, and frequently all the functions of the brain are entirely restored after some hours: sometimes some slight vestiges of those complaints continue for some days; and then, the vessels being again gradually contracted, the equal circulation of the humours through the brain returns. But where the humours have been extravasated, a fatal apoplexy follows; or, some part of the medulla of the brain being rendered impervious, the disease remains insuperable during life. I have seen a great number of melancholy cases of this kind, where children, being seized with strong epileptic paroxysms, continued hemiplegic as long as they lived: others have been seized with an incurable deafness: many have remained idiots ever after; and I have seen numbers of such wretches in the hospitals, who have been idiots from their infancy; all of whom, whose history I could gather from their parents or relations, I found to have been epileptic before.

2. From what was said in the preceding aphorisms it appears, that during the time of the epileptic paroxysm the muscles are put into very strong action, and indeed much stronger than could be excited in the same persons in health by the command of the will. Thus a delicate girl shall have so much strength, while she is in the epileptic fit, that she can hardly be prevented from hurting herself by several of the strongest men. It is observed, that the balls of the eyes roll with incredible celerity under the shut eye-lids; whence the muscles which move the eyes are very much strained.

^a De Causis et Signis Morbor. Diuturn. lib. i. cap. 4. p. 29.

strained, and incurable distortions of the eyes themselves frequently continue as long as the patient lives. But most part of the muscles are fixed to bones, and move those which are articulated with each other; hence in young persons, whose epiphyses are easily disjoined from the bones, deformities happen which are often incurable. Sometimes the limbs are so twisted, as that the ligaments are overstretched, nay and sometimes broke; whence follow luxations, the most painful inflammations about the joints, and anchyloses. Nay, we read of a boy of ten years of age, who had the os humeri, tibia, and fibula, broken in an epileptic paroxysm^b; and though they were set again, and secured with proper bandages by a skilful surgeon, a fresh paroxysm returning, they were again moved out of their place, and the broken os humeri perforated the skin itself before he died. If now at the same time we consider, that the nerves in the joints run between the muscles, it will easily appear, that those likewise may be hurt by such distortions of the joints; whence sometimes palsies, atrophy of the parts, and incurable weaknesses, afterwards follow. While a patient was seized with an opisthotonus, in the time of an epileptic paroxysm, so that the hind part of his head was bended backwards almost to his buttocks, and the vertebræ of the back cracked, which I remember to have seen with much concern; how great was the danger, lest the medulla spinalis, and the nerves going out between the joints of the vertebræ, should have been hurt? Whence it appears that numerous and various complaints may follow the epilepsy, from such distortions of the joints only, and the violent actions of the muscles during the time of the paroxysm.

3. It is demonstrable from physiology^c, that while a muscle is in action, the muscular fibres swelling forcibly straiten the interstices interposed between them, and therefore compress and empty the veins dispersed thro' the substance of the contracted muscle; and that the arteries, at the same time compressed,

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^b Boneti Sepulcret. Anat. lib. i. sect. 13. p. 332.
Institut. Medic. §. 406.

^c Boerh.

cannot admit the red blood; whence the flesh of an acting muscle becomes pale^d. But during the epileptic paroxysm the violent convulsion much exceeds the usual contraction of the muscles in the time of health, as was said very lately; and therefore the blood-vessels are much more strongly compressed. Hence the blood driven by the force of the heart through the arteries to the muscles, will stick, obstruct the vessels, and thus may produce an inflammation; (see the comment to §. 375.) But those arteries which are distributed to the skin in the cellular membrane, will be distended by the force of the blood, while the muscles swelled by the convulsion will not admit any: hence the smaller vessels will be dilated, and will admit the thicker parts of the humours which cannot pass thro' their extremities; whence another cause of inflammation is produced, (see §. 378.) Nay, we see, that, after strong epileptic paroxysms, the lesser cutaneous veins sometimes burst, and very red little spots remain dispersed over the whole surface of the body, which afterwards gradually disappear. But where the broken vessels, or their dilated extremities, spue out the red blood into the cellular membrane, then broader spots and ecchymoses are conspicuous. Physicians versed in practice have frequently observed these symptoms.

But if the muscles continue long thus rigid, distended with a violent convulsion, the arteries and veins composing the substance of the muscle admit nothing from the blood, and therefore a tendency to a mortification is produced; for this, as was said in the comment to §. 419, is that disposition of a soft part, which, from the influx of the blood by the arteries, and its efflux by the veins, being hindered, has a tendency to death.

The motion of the venous blood is indeed accelerated by the neighbouring muscles being turgid while they act, and their compressing the veins near them: but it was remarked in the comment to §. 1073, that the respiration is most frequently hindered, in the
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^d Ibid. §. 401. n^o 7.

time of the epileptic paroxysm, whence the right ventricle of the heart cannot freely transmit the blood thro' the lungs; and therefore the veins cannot be evacuated, but remain turgid, and frequently become varicous. Upon this account Trallian^e seems to have remarked, from the comments of Appollonius, that the veins under the tongue turn greenish in epileptic persons, *viz.* while, being rendered varicous by strong and repeated distension, they communicate that unusual colour to those parts. Hippocrates likewise mentions as a sign of a preceding epilepsy, *venas crassas circa ventrem varicosas*, “ the large vessels about the “ belly varicous f.”

Hence likewise the reason is understood, why the bodies of epileptic persons, who have died in the height of a paroxysm, frequently put on such a dreadful aspect; especially if before their death they are seized with an universal tetanus, as sometimes happens. For the blood, propelled by the arteries, cannot pass thro' the substance of the muscles, while they are swelled with a violent spasm: hence it is pressed into the cutaneous vessels, and poured out into the cellular membrane; and so much the more, as the distended veins cannot empty themselves into the right ventricle of the heart. Hence the whole skin is swelled with the blood accumulated in its distended vessels; the cellular membrane is filled with the same liquid extravasated; the whole surface of the body appears black, especially the face, eye-lids, and lips; they swell dreadfully; the turgid tongue is thrust frightfully out of the mouth; if the body lies upon its back, the parts pressed upon by its weight look whitish, while all the rest are inclined to black. If the hand, in a tetanus, was pressed against the breast or belly before death, the mark of it remains: which the famous Boerhaave saw in a boy, who died of this disease; and he could scarce persuade the melancholy parents that such terrible effects could be produced from natural causes, the whitish impression of the hand upon the carcass had so fright-

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^e Lib. i. cap. 15 p. 7.

f Prædict. lib. ii. cap. 7. Charter. Tom. VIII. p. 816.

ened them, the rest of the body being black like a negro. It very seldom happens, that epileptic persons have been cut off in the height of the paroxysm; they much more frequently become apoplectic in the end of it, and so die.

4. It was observed in the comment to §. 1073, that those convulsive motions affect not only the external muscles, but likewise the internal parts of the body, as appears from the borborygmi and noise of the abdomen, and its swelling suddenly in the time of the paroxysm, as also from the sudden and strong agitation of it. Hence it is no wonder, that the contents of the stomach are so often expelled by vomiting, besides several humours which may be brought into the cavity of the stomach and duodenum: for this reason, while the pendulous liver, together with the gall-bladder, is so agitated by those violent convulsions of the diaphragm and abdominal muscles, great quantities of bile are sometimes thrown up; and frequently afterwards, the bile being thus exhausted, chylication is carried on in a very languid manner. It is obvious, that the same thing must happen to the lymph of the pancreas. Further, while the veins, being filled with blood, and not able to empty themselves freely into the right ventricle of the heart, become swelled, the arterial blood forces its way into the excretory ducts in the cavity of the mouth, fauces, nostrils, &c. and dilates them, whereby a considerable quantity not only of lymph, but likewise of a thick mucus, is voided by the mouth and nose, in the same manner as is observed in those who are strangled; for Aretæus has justly remarked, as was said before in the comment to §. 1073, that those who are seized with a violent epileptic paroxysm suffer the same as persons who are strangled. There is a free outlet for the lymph and phlegm in those parts; but when the exhaling vessels in the internal cavities of the body pour out their humours more plentifully and more viscid, a collection is made of that stagnating matter, which, on account of its greater viscidness, or quantity, cannot be reformed by the bibulous veins. Hence, in the
bodies

bodies of persons who have died of the epilepsy, lymph, or even a thicker humour, has been found in the cavity of the skull; which is usually then looked upon as a cause of this disease, whereas it appears more frequently the effect of it. The same may likewise happen in other cavities of the body; but it is most frequently observed in the head, because in the epileptic paroxysm we see that the vessels of the head are more filled and distended than in other parts of the body. For the same reasons, also, those who suffer strong and frequent epileptic paroxysms, have the eyelids swelled; nay, frequently the whole face as it were pale and bloated, while the lymph remains collected in the cellular membrane, as usually happens in leucophlegmatic persons. Hence likewise is understood, why the epileptic fit may terminate in an apoplectic sleep, while the vessels distended with blood, and the lymph which is collected, press upon the brain. Afterwards the free passage of the blood through the vessels being restored, the patient awakes, but frequently remains dull and forgetful several days; till, the extravasated lymph being again resorbed, the functions of the brain are perfectly restored; which, unless that resorption happened, would remain evidently hurt. This is likewise confirmed from hence, that those who are inclined to an apoplexy from a glutinous cacochymia of the blood, have symptoms of the same kind (see §. 1010. No II. 3.) with epileptic persons after the fit is over.

The like excretions also happen by stool for the same reasons; neither does this seem to be owing so much to the sphincters of the anus and bladder being rendered paralytic, but rather to the strong action of the diaphragm and abdominal muscles overcoming the resistance of the sphincters. Indeed the excrements and urine are voided without the patients being conscious of it: but it is not done by degrees, as happens in a palsy of those parts; but with a violent force, so that I have seen the urine squirted to the height of five feet and more from an epileptic boy. In adults, the semen is likewise ejected; as *Ægineta* also has re-

marked §: whence they often become very languid, if they are seized with frequent paroxysms.

But it has likewise been observed, that the excrements, voided during the time of the fit, are often of a greenish colour; and hence some have concluded, that an acrid, eruginous bile, as it is called, ought to be reckoned as the cause of this disease. It is certain, that an irritating acrimony in the primæ viæ may produce an epileptic fit, as we frequently observe to happen in infants: but at the same time it is true, that violent and sudden changes of the nervous system are capable of thus altering the bile in a moment; whence doubtless that green colour of the excrements is frequently the effect of the disease, but not the cause. It appeared in the comment to §. 267, where we treated of Wounds of the Head, that a sound person, falling from a high place upon his head, immediately vomited such bile; and at the same it was observed, that the tossing of a ship alone produces the same effect in many persons. In hysteric women, from a sudden anxiety of mind only, a vomiting of greenish bile is occasioned. But as in this disease there is produced so great and sudden a change in the whole nervous system, it will not appear strange that a like change of the bile should thence also happen.

It will be no wonder, if the vessels should be broke by such violent concussions, and thus the blood be evacuated upwards or downwards: besides, as was said before, the tongue is frequently intercepted between the teeth, and bleeds sometimes very plentifully. But it also appears, that by the free return of the venous blood to the heart being hindered, the distended vessels may be rendered so turgid, and the blood so pushed into the small excretory branches, that they may even transude the red globules. I have several times seen a viscid foam, tinged with blood, voided from the mouth and nose in the time of the paroxysm; and yet afterwards I could not observe the least appearance of a hurt in the tongue or other parts within the mouth, although I examined them with the greatest care.

care. If now the vena cava passing through the liver happens to be very full, and cannot empty itself into the right ventricle, then the vena portarum will not be able to transmit to it the blood remaining after the secretion of the bile; while in the mean time the convulsed abdominal muscles and diaphragm propel the venous blood towards the liver with such force; hence the mouths of the vessels opening into the cavity of the intestines may easily be dilated, so as to transfuse the blood itself, without any rupture of these vessels. In like manner, also, the liver being thus distended, the blood returning from the spleen, by the *vasa brevia*, as they are called, may make its way into the cavity of the stomach. Thus the reason appears, why blood may sometimes be voided upwards and downwards, during the paroxysm, or after it is over; which I have also observed in practice.

From what has been said it appears, that in the time of the epileptic fit all the secretions and excretions may be disturbed: hence the functions may remain surprisngly changed and hurt, after a violent paroxysm, or frequently repeated fits; and these changes may be very various. Hippocrates^h has mentioned a great many such; and several others have been observed, which would be too tedious to enumerate. it is sufficient to have pointed out the sources of those symptoms.

But when, by such violent commotions being excited, and by so many evacuations during the time of the epileptic paroxysm, the cause can be expelled which by irritating produced the disease, then health is perfectly restored, provided the irritation can be prevented from being renewed. This appears chiefly in infants, to whom this disease is very common, while any thing acrid is lodged in the *primæ viæ*, or a morbid infection, to be thrown out upon the skin, remains mixed with the blood. All practical physicians very well know, that infants are frequently convulsed while the eruption of the small-pox or measles is just at hand; nay Sydenham, as will be said afterwards in the

^h Prorrh. lib. ii. cap. 7. Charter. Tom. VIII. p. 816.

the history of the small-pox, has observed the event of the disease to be almost always fortunate, if children are convulsed about the time of the eruption. I have often enough seen children seized with convulsions, while running ulcers of the head have been imprudently dried up by preparations of lead in ointments, which discharges happily returned after an epileptic paroxysm. How often has it been observed, that children have fallen into this disease from recrements loading the stomach and intestines; which being evacuated upwards and downwards in the time of the paroxysm, they have quite recovered, and remained perfectly free from the disease ever after. But as the cutaneous vessels are frequently dilated with so great force during the epileptic fit, as was said in the preceding number, the reason appears, why noxious miasmata, mixed with the blood, are often happily thrown out upon the skin after the epileptic paroxysm; which of its own nature is not void of danger, but nevertheless in this case has sometimes a good effect.

§. 1078. **H**ENCE is understood, what an hereditary epilepsy is, and why it is never curable: What an idopathic, and why this kind is seldom curable: What a sympathetic, and why frequently to be cured.

What an hereditary epilepsy, &c.] *Viz.* when the disease is propagated from epileptic parents to their children; concerning which we treated before in the comment to n^o 1. of §. 1075. That this shocking disease is propagated by an hereditary taint, has been also observed by Hippocrates; hence he has said, *But it begins, like several other diseases, in a family. For if a phlegmatic parent begets a phlegmatic child, a bilious parent a bilious child, a consumptive parent a consumptive child, and a splenetic parent a splenetic child; what should hinder, that a person whose father and mother were subject to this disease, should not be subject to it likewise? For generation matter proceeds from all*
parts

parts of the body, the sound from sound parts, or the diseased from diseased^a.

An hereditary epilepsy has been reckoned incurable by all physicians; and indeed not without reason. For the knowledge of the cause contributes very much to the success of the cure: But who can distinguish that which is communicated by the parents to the rudiments of the offspring, and frequently does not discover itself by any sign; and yet afterwards produces this disease? how, and by what remedies, shall the physician remove this latent impression? perhaps it is not more possible to hinder it from breaking out, than to prevent the teeth or beard from growing, the rudiments of which had existed a good while, and yet they only emerge at a certain time of life. Hence it appears impossible for the physician to remove that morbid impression derived from the parents to their offspring; and in this sense an hereditary epilepsy is called incurable. But, as was said in the comment to the first number of §. 1075, sometimes the disease is transmitted from the grandfather to the grandson, the father himself escaping; though at the same time he communicates the morbid impression to his offspring. Hence there ought to have been some cause in the son, which hindered the latent seeds of the disease from breaking out. A firm habit of body, a sober and laborious life, and perhaps several other circumstances, may prevent the accidental causes from rousing the latent predisponent one, which together constitute the immediate cause of the epilepsy, and so produce the paroxysm. But concerning this we shall treat more at large in the comment to §. 1080.

What an idiopathic, &c.] While a perfect epilepsy is produced, its cause is lodged within the cranium, in the brain itself, and indeed in that part of it where the source of action of the senses and voluntary motions

^a Incipit autem, velut etiam alii morbi, secundum genus. Si enim ex pituitoso pituitosus, ex bilioso biliosus gignitur, et ex tabido tabidus, et ex lienoso lienosus; quid prohibet, ut ejus pater et mater hoc morbo correpti fuerint, eo etiam posterorum aliquis corripiatur? Genitura enim ab omnibus partibus corporis procedit, a sanis sana, a morboris morbosus. *De Morbo Sacro, cap. 3. Charter. Tom. X. p. 478.*

tions is placed: when therefore this cause is not excited by another occasional cause lodged in some other part of the body, the epilepsy in this case is called by physicians idiopathic; in which both the predisponent and occasional cause are seated in the brain itself. In this kind of epilepsy, there is frequently no warning of a future paroxysm: it is true indeed, that this case happens but seldom; yet sometimes an epilepsy of this kind is observed, in which persons who appeared before in perfect health fall down instantaneously.

But all physicians have acknowledged, that this species of the epilepsy is very hard to cure. For the chief hope of curing this disease depends (as will be said more at large afterwards) upon discovering the exciting cause which renews the paroxysm. But the causes lying concealed in the brain are so obscure, that they can hardly be discovered except by the effects; for they do not fall under the cognisance of the senses. Hence Hippocrates^b, treating of the prognosis of this disease, has pronounced those epileptic persons very hard to be cured, *quibus factus fuerit morbus nullam significationem præbens* (*μὴδεν προσσημαινον*) *ex qua corporis parte initium sumat*, “in whom the disease affords no “sign from what part of the body it takes its origin.” Celsus also expresses himself to the same purpose, saying, *In the same disease, if the whole body is affected at once, and no sense of the approaching fit is felt in any particular part, but the person falls down unexpectedly, of whatever age he is, he can hardly be cured*^c. This still increases the danger, that as those who, feeling the disease coming upon them, can take care to prevent any accident happening to them in the time of the paroxysm, by desiring the assistance of those who stand by; those, on the contrary, whom the paroxysm seizes unexpectedly, frequently dash their head and limbs against the pavement or other hard bodies, fall
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^b Prædict. lib. ii. cap. 7. Charter. lib. viii. p. 816.

^c In eodem morbo si simul totum corpus afficitur, neque ante in partibus aliquis venientis mali sensus est, sed homo ex improvviso concidit, cujuscumque is ætatis est, vix sanescit. Lib. ii. cap. 8. p. 72.

into the fire, &c. which Aurelianus^d has likewise remarked.

What a sympathetic. &c.] It appeared from what was said in the comment to §. 1075, where we treated of the causes of the epilepsy, and especially in the fourth, fifth, and sixth numbers, that a strong irritation of the nerves, even in the most distant parts of the body, may produce this disease, although no symptom indicates that the brain is any way hurt; and *vice versa*, those irritating causes being removed, the disease is thereby cured. It appeared there likewise, that some humours being obstructed, which used formerly to be excreted, produce this disease. But the epilepsy arising from a cause of this kind is called by physicians *sympathetic*, and likewise *deutero-pathic*, because in such a case the brain is not primarily affected, but is drawn as it were into consent, by some other part which was affected before. Hence, all persons seems to be liable to this disease, provided strong irritations are applied to certain parts of the body. Water-parsley, or the water-hemlock of Gesner, in the stomach of a strong person, is capable of producing the worst kind of epilepsy; as are also several other poisons. A bare tendon, after a slough cast off, being laid hold of with a pair of forceps by an unskilful surgeon, in a moment occasions an universal tetanus, (see §. 164.). Such powerful causes may produce this disease in the strongest persons: but slighter ones are sufficient to occasion it in those, whose whole nervous system, and the common sensory itself, is more easily irritated. Thus we see infants frequently rendered epileptic by an acid in the *primæ viæ*, while a strong grown person is only affected with gentle gripes from the same cause: While a tooth which is just about cutting, stretches and irritates the gum, very frequently infants are seized with the epilepsy; whereas, in adults, the most violent pains from the tooth-ach are suffered for whole days without any symptoms of the epilepsy following. Concerning that surprising power, whereby recrements, lodged about the stomach, may disturb the actions of

the brain, was said before in the comment to §. 701. where we treated of Delirium in Fevers; and numerous practical observations seem to teach us, that perhaps more nerves in the body have a similar influence upon the common sensory, as may easily be gathered from what was said in the comment to §. 1075. Thus we see, that a great many epileptic persons, before they fall down, have strange convulsions of the muscles of the face, mouth, &c.: some perceive unusual tastes in the mouth: in others the neck is twisted, the shoulders shaken, the hands distorted, &c.; and frequently by a sudden and strong friction of those parts the epileptic paroxysm, which was just coming on, is prevented. In cases of this kind, that first irritation, which was about to produce the paroxysm, seems to be lodged in those parts.

In the mean time it is to be observed, that a particular part of the body may be first affected in the idiopathic epilepsy, although the cause is not lodged in that part, but in the brain. Thus it frequently happens, that when an apoplexy is coming on, the tongue falters, soon after the speech is lost, and the lips are drawn obliquely upwards on one side; after which the disease of the whole common sensory immediately follows: hence it may happen, that the disease may begin to be formed idiopathically within the cranium, discovering itself only by a small part of the brain being affected whence the nerves arise going to that part of the body in which that change appears. We therefore do not then believe, that the apoplexy is propagated from that trembling motion of the tongue, distortion of the lips, &c.; but these signs teach us that the brain is already affected, and the same cause afterwards increasing abolishes all the animal functions. So likewise in the epilepsy, although a change may be produced in some parts of the body before the paroxysm, yet it is not thence certain that the fomes of the disease is lodged in that part: for the epilepsy may be idiopathic for the reason above given, altho' it may seem to arise in some other part of the body affected before; the complaint of this part being only an index

of the cause lodged in the brain, which now begins to act, so as to produce the paroxysm. But that doubt may be cleared up, by applying a remedy to the part, which is first affected, when the fit is coming on: For if by rubbing, pressing, or tying this part, the paroxysm is prevented, or much retarded, then we know that the brain is not primarily affected, but only by the fomes of the disease lodged in this other part; and on the contrary, if those topical remedies are tried without effect, then it may be justly concluded, that the epilepsy is idiopathic, its whole cause being lodged in the brain; and being rendered active, immediately affecting the origin of the nerves going to this part of the body, and afterwards suddenly increasing, it disturbs the whole frame. Therefore, also, in such a case the signs of the beginning paroxysms are not always observed in the same part of the body, but in different places; whereas on the contrary, in a sympathetic epilepsy, the first warning of the fit is always felt in the same part of the body. But it easily appears, that a topical remedy may always be safely attempted in that part where the approaching paroxysm is first felt: for thereby either the disease will be rendered more gentle, or the knowledge of the seat where the cause of the disease is lodged will be more evidently discovered.

At the same time likewise, the reason appears, why the sympathetic epilepsy is frequently curable: for in several parts of the body, in which the fomes of the disease is observed to lodge, an outlet can be made for that noxious morbid matter, by blisters, the cautery, &c. or the nerves, by the irritation of which the whole common sensory in the time of the paroxysm is disturbed, may be destroyed; which has frequently been done with very good success, as will appear afterwards when we come to treat of the cure.

For this reason the ancient physicians have formed the like prognosis, *viz.* that the epilepsy, when it takes its origin from other parts of the body, is more easily cured, but especially when it arises from the feet and hands; that the cure is more difficult, if it

proceeds from the side; and that the disease is worst of all, if it begins in the head^c. For it is to be remarked, that some epileptic persons, before the paroxysm, feel pains of the head, and creeping sensations in the scalp, dizziness, &c. In these indeed the paroxysm does not begin without any previous signs; and therefore it is distinguished from the idiopathic epilepsy: but however, the exciting cause is lodged near the brain; nor can those remedies be safely tried, which were successfully applied to the hands and feet when the disease seemed to take its origin from those parts.

§. 1079. **A**ND it likewise appears, that very different remedies, and different methods of cure, are required in this disease, according to the known variety of the cause, of the peccant matter, and of the part to which the application of the remedy, and by which the evacuation of the morbid matter, ought to be made.

Having treated of the diagnosis, causes, effects, and prognosis, of the epilepsy, we come next to speak of the cure of this disease.

But as it is evident from what has been said, that this disease appears in such various shapes, and is produced from such different and numerous causes; so we may easily see, that no general method of cure can be established, but that the indication ought to be gathered from the knowledge of the cause of the disease, which can only be discovered by a very careful observation of all those symptoms which occur in each particular patient. Whence at the same time it is manifest, how vain it is to boast of an universal remedy, or method, for curing every epilepsy; of which we shall speak more afterwards in the comment to §. 1085.

But the principal origins, from whence the different methods of cure in this disease are derived, are mentioned in this aphorism.

Ac-

^c Hippocrat. Prædict. lib. ii. cap. 7. Charter. Tom. VIII. p. 816. Cels. lib. ii. cap. 8. p. 68.

According to the known variety of the cause.] This disease more frequently occurs in childhood, as was said before; yet in this state it arises from very different causes. Thus an epileptic paroxysm is often produced in tender infants from the milk coagulating by an acid in the primæ viæ; in such a case, medicines which weaken that acidity, and quickly expel it out of the body, are the best anti-epileptics. But it would be useless to give these, when the gum swelled, painful, and inflamed, is irritated by a tooth which is just about cutting; in which case an incision by a lancet is the only remedy. Other remedies again are required, when the epilepsy arises from the variolous contagion, which is to be thrown out upon the skin; as will afterwards appear when we treat of that disease.

Of the peccant matter.] For that is often not only of very different qualities, but likewise lodged in different parts of the body. After a violent contusion of the head, extravasated blood compressing the encephalon has sometimes produced the epilepsy, as appeared in the history of Wounds of the Head. In this case it is cured by removing the extravasated blood by means of the trepan. But if a venereal tophus, eroding the bony substance of the cranium, oozes forth an acrid sanies; although an outlet is made for this matter, yet the disease will not thereupon be cured, because the same sanies continues daily to drip out, and therefore may renew the complaint afresh; on which account a different cure is required. When it arises from poisons remaining in the stomach, it is plain, that another method of cure is requisite, by which this poison may be either expelled, or so mitigated as not to be capable of hurting any more.

Of the part to which, &c.] If the epileptic paroxysm always arises from a certain part of the body, as when a cold blast or vapour is perceived ascending from the foot towards the head, and the person falls down epileptic soon after; a proper topical remedy ought to be applied to this part, that a free passage may be made for the matter lodged here; or the nerve destroyed, by the irritation of which the whole com-

mon sensory is disturbed.---When it arises from some humours being stopt which used formerly to be excreted (see §. 1075. No 5.), the best remedy is to promote the evacuation of those humours by the same outlets through which they used to pass before the disease.---When the running ulcers in the heads of children are cured by drying ointments, the epilepsy almost always follows upon it. In this case it is effectually and expeditiously cured, by applying to the shaved head a gentle aromatic plaster, with a small quantity of blistering plaster mixed with it; as for example, an eighth part of a blistering plaster mixed with an ounce of melilot, or the like, and so spread and applied to the head; by which, in a few hours, an acrid ichor will be discharged, and the epilepsy relieved.---When it arises from a suppression of the menstrua, lochia, or hæmorrhoids, these evacuations ought to be promoted by proper remedies. For these discharges are not so easily supplied by other evacuations, as is commonly believed. Bleeding indeed lessens the quantity of the blood, while either the menstrua or lochia are suppressed: but nevertheless the uterine vessels still remain too full, and this fulness produces the worst diseases; which are hardly to be cured, unless the blood which is retained there makes its way through the usual passages. Persons subject to the hæmorrhoids find more relief from two ounces of blood voided that way, than from a pound taken from a vein by the lancet. In a true ischury, physicians have tried hydragogue purges, and powerful sudorifics, to carry off by other passages what was retained; but always with a fatal event, unless a free secretion and excretion of the urine were restored.

§. 1080. **T**HE epilepsy arising from the first and second cause, consisting in a bad conformation of the solids (1075. No 1, 2.) hardly admits of a radical cure; but the physician may safely remove the causes renewing the paroxysms, as they are constantly growing afresh: whence

whence these, which are infinite, and only to be known by observation, ought to be carefully investigated, and then cured according to their nature.

The causes of an epilepsy, as was observed before at large, are two: the one *predisponent*; the other *exciting*, which, joined to the former, constitutes the immediate cause of the disease, and therefore produces the disease itself. But the exciting or occasional causes do not make the disease, but when the predisponent cause is present. Wherefore the cure of this disease is likewise twofold: one radical, which is capable of destroying the predisponent cause that is often very latent; the other, which removes, or prevents, the procatartic or occasional causes, the predisponent still remaining. It appears at first sight, that that cure is the most complete, which removes the predisponent cause; therefore that this ought always to be preferred, provided it can be accomplished. Thus, for example, in new-born infants and children, the softness of the brain, and the easy irritation of the whole nervous system, seem to constitute the predisponent cause of the epilepsy, which is quickened into action by the slightest occasional causes supervening: and thus the epileptic paroxysms are so frequent in children. But as they grow up, that too great softness of the brain is corrected; and, the body being gradually strengthened, the too easy irritability of the whole nervous system is diminished; and they continue ever after free from this disease, which they had frequently suffered during their infancy. Therefore the most skilful of the ancient physicians^a placed their greatest hope in that change of the body which is brought about by age; so that Ægineta advised, in infants, who were seized with the epilepsy, to try nothing at all: “for by becoming of a more bilious and dry habit as they grow older, and by a diet more sparing, the disease for the most part is cured of itself^b.” At the same time

^a Hippocrat. Aphor. 45. sect. ii. Charter. Tom. IX. p. 84.

^b Lib. iii. cap. 3. p. 29, versa.

time this example teaches us, that we are not to lay aside all hope of removing or correcting the predisponent cause in epileptic patients.

But when this predisponent cause arises from an hereditary taint, and after lying concealed for several years produces this disease when the person is grown up and the body strong, it easily appears, that small hopes can remain of effacing this latent morbid character, impressed by the parents upon the stamina of their offspring. The same is also true of that morbid impression made upon a foetus from a fright of the mother; which is hardly to be removed ever after. Hither likewise might be referred a bad configuration of the cranium, while in the time of labour a large head of an infant is forced thro' a narrow pelvis by strong throes of the mother, and the figure of the skull hurt by the hands of a rash midwife; for unless that can be helped immediately after the birth, incurable complaints will afterwards remain. I remember to have seen several, in the hospitals for incurable epileptic persons and idiots, in whom the shape of the skull could plainly be observed to be faulty. Farther, it appears from what was said in the comment to §. 1075, no 3. that this disease, when it has arisen from a fright only, has remained incurable during life, although the cure was attempted by the best remedies. Hence, from this affection of the mind only, this predisponent cause has been produced, and never after could be eradicated.

We come now to examine what is to be expected from the art of physic in removing causes which are so latent, that the most skilful physician dares not pronounce what is changed in a person who was the moment before in perfect health, and is now epileptic. As far as I am able to understand, from what the ablest physicians have observed to happen in this disease, or attempted towards its cure, almost the only hope consists in producing a great change in the body. They have not determined what ought to be changed in the epileptic person, in order that the health might be restored; but only endeavoured to change the present

condition of the body into another: for they rather chose to try something though uncertain, than to leave those wretched patients to their fate. Neither ought it to be believed, that such remedies were tried from a blind impulse; but by the direction of reason, while art followed nature in the cure of this disease. Hippocrates^c had observed, that about the time of puberty, when the whole body is so surprisngly changed, the epilepsy sometimes ceases; therefore he has commended a change of climate and manner of living^d for removing this disease: and the same thing has been confirmed by the observations of later physicians. I have known epileptic persons, who have sailed to the East-Indies, remain free of this disease as long as they lived there: but returning home again, and suddenly squandering away (which is usual amongst sailors) what they had got with great labour and danger, have again relapsed; while others, again, have remained free from the disease. But as physicians cannot always prevail upon their patients to agree to those great changes of climate and manner of living, they have studied other changes of the body with the same intentions. For it appears from medical observations, that other diseases coming on, and changing the body very much, have cured the epilepsy. So Hippocrates remarks, “ That those who are seized with a quartan, do not “ suffer the great disease; and that a quartan coming “ after that disease cured it^e.” Galen in his comments upon this passage demonstrates, that by the *great disease* here ought to be understood the epilepsy; which is likewise confirmed by another text of Hippocrates^f, where the same things are observed, and instead of *της μεγαλης νοσου*, *the great disease*, it is read *σπασμων*, *convulsions*. Observations of later authors confirm those of Hippocrates. An epilepsy, which returned afresh every week, after various remedies had been tried without success, was cured by a quartan fever; and the person lived healthy afterwards, although the fever

^c Aphor. 7. sect. v. Charter. Tom. IX. p. 197. et Aphor. 45. sect. ii. ibid. p. 84. ^d Ibid. ^e Epidem. lib. vi. Charter. Tom. IX. p. 550. ^f Aphor. 70. sect. v. ibid. p. 242.

ver was removed by the Peruvian bark ^g. A boy ten years old, who had been three years epileptic, the paroxysm returning several times a day, having used a great many remedies without success, was seized with an epidemical fever, attended with several dangerous symptoms; but happily he got the better of the disease, and afterwards continued free from the epilepsy ^h.

Physicians, incited by these and such like examples, have endeavoured to destroy the immediate cause of the epilepsy, by raising violent commotions in the body by powerful medicines; not always with a view of expelling the morbid matter by very strong purges, vomits, &c. but that by such great commotions the present latent disposition, which nourishes the disease, might perhaps be changed. Thus Trallian ⁱ, when the disease was of long standing and obstinate, had recourse to white hellebore; and Ægineta ^k commends the like remedies. Modern physicians have used mercurial and antimonial remedies with the same view, as we find here and there in the collections of medical observations. It is sufficient here to have observed the principal heads of those causes; to describe each of them, would be more tedious than useful. But it easily appears, that there is great need of caution here, while these strong Herculean remedies are tried; which being rashly used by quacks, on weakly persons, have frequently terminated the disease in death.

Others indeed use milder remedies, to produce the same effect; but such as penetrate the whole body with a wonderful force, themselves almost unchanged. In Asia they give large doses of musk; and Hoffman ^l has adopted this practice. I gave ten grains of musk, with very good success, repeating it several times, to a girl of eight years old; and for several days after, her saliva, urine, and sweat, smelt of musk; so that it was disagreeable to those about her who were not used to it. The chemists have searched for such a remedy in metals resolved to their first principles by art,

^g Miscellan. Curios. decur. 3. anno 3. p. 34.

p. 298.

cap. 13. p. 29. versa.

ⁱ Lib. i. cap. 15. p. 75.

^l Medic Ration. Tom. IV. part. iii. p. 23.

^h Ibid. anno 7, 8.

^k Lib. iii.

art, which should not act by evacuating, but only by changing insensibly. Helmont meant this when he said, "The perfect cure of the gout, falling-sickness, madnes, and asthma, consists in removing the seminal character and incorporeal ferment, and not in evacuating any kind of humour ^m." I have seen a remedy prepared from copper with a great deal of labour, which, when taken, occasioned no kind of loathing, but a strange creeping sensation as it were over the whole body to the fingers ends; and that I have known to be of service to some people. Aretæusⁿ gave copper to epileptic persons, but with an intention to expel what was noxious by vomit or stool: however, that remedy, without disturbing the primæ viæ, seemed to penetrate to the inmost recesses of the body, and to act upon the whole nervous system, by surprising, indeed, but very mild concussions: whence it appears, what good can be expected from these, and perhaps from others of the same kind; especially as such remedies are much more safe, than those which act by evacuating strongly, and are not so easily borne by persons of weak constitutions. In the mean time Aretæus^o has justly remarked, that something ought to be attempted here; saying, there is need for the strongest and most powerful remedies in this disease, which is so terrible and calamitous that he believed that epileptic persons could not bear to live, if they knew what grievous and disagreeable things they suffered in the time of the paroxysm. But certainly those wretched persons are so far happy, in that, being deprived of all sense, they do not know their misfortune, and recover from the paroxysm dull and unmindful of every thing that happened during the time of it. At the same time he remarks, that the best method of treatment is to follow the simplicity of nature, which frequently cures this disease by a change of the body from age; and therefore he advises a change of diet. But after this has been tried in vain, then they ought to proceed to more powerful remedies, but always with great

^m P. 405.ⁿ Lib. i. de Curat. Morbor. Acutor. cap. 5.

p. 84.

^o Morbor. Diuturnor. Curat. lib. i. cap. 4. p. 125.

great prudence.

However, it too frequently happens, that after every endeavour, the immediate cause of the epilepsy cannot be removed. Then all that can be done is, to prevent, or remove, the occasional causes; which, being united with the immediate cause, renew the paroxysms. It is true indeed, that those occasional causes are almost infinite in number, and frequently differ in different patients; and therefore often require the most accurate and frequently repeated observations. But this irksome task the physician must submit to, if he is desirous of relieving those wretched patients.

It ought therefore to be inquired into, with the greatest care, in what part of the body the first signs of the approaching paroxysm are observed: then all the symptoms ought to be accurately taken notice of, which appear from the beginning to the end of the paroxysm, and in what order they succeed each other. At the same time it must be remarked, whether any thing applied to the body by chance, or designedly, during the time of the paroxysm, or in the space between the fits, has been of service, or hurtful. It ought to be observed, at what time of the year the paroxysms are more frequent and strong; whether they happen about the change or full of the moon; what good or hurt the usual evacuations of the menstrua, hæmorrhoids, sweat, &c. produce; what effect the winds, the temper of the air, and meteors, have in this disease (for a great many epileptic persons are seized with a fit in the time of thunder): farther, it ought to be inquired, what effects the use of the six non-naturals, the gesta, ingesta, &c. produce in this disease, as it has frequently been observed, that anger, wine, venery, grief, and close attention of the mind, have brought on the paroxysm before the usual time.

It is true indeed, that physicians themselves seldom have it in their power to gather all these observations, as they are not always upon the spot with their patients; but then they can give rules for such observations

vations to those who are about the patients, that they may carefully remark every thing that happens to them day after day, and reduce them to a diary. I have seen the most skilful physicians sometimes give medicines to persons of quality, which were not hurtful indeed, but from which they did not expect much service, and at the same time enjoined them strictly to observe all the above circumstances: thus they seemed to be very solicitous about the effect of the remedies prescribed, when they rather wanted to collect the history of the disease, than attempted to cure, or at least to relieve it.

These observations being thus collected and digested into order, the physician ought carefully to examine them all, and he will easily discover the rules of what is to be done and avoided; but only in the particular case of that patient: for general rules are not to be had in curing all epileptics; because what is of service to one, is often hurtful to another. After this is done, the whole difficulty disappears; for what remains is only an easy execution of well-weighed determinations. It is certain, that physicians, who are hurried with too great practice, are frequently deficient in the cure of this disease, as they have not time to bestow sufficient care upon every particular patient: and they have likewise often regretted, that the persons who look after the patients have observed those things which they have neglected, not without hurt to their reputation. I firmly believe, that if physicians would apply their minds attentively to it, they might cure a great many epileptic persons, and be of service almost to all. Galen observing in the young schoolmaster (see §. 1075, n^o 4.) that the paroxysm came on if he suffered hunger, found that by giving him a bit of bread the fit could be prevented. I have seen an epileptic young man, whose under-lip used to tremble before the paroxysm began; a symptom which frequently precedes vomiting: presently after, he fell down epileptic: and if he vomited during the paroxysm, it soon went off. As he suffered a return of the disease every month about the full of the moon, a

gentle vomit was given him once a month, three days before the moon was at the full, and in the same evening a moderate dose of diacodium; on other days he made use of strengthening remedies; and in the space of six months, by means of this method, he was cured. For when the paroxysm can be prevented for a while, that predisponent cause seems gradually to diminish, having not been excited for a great length of time. It was observed before, in the comment to §. 1075, no 3. that Galen has compared the returning paroxysm to a renewing the memory, as it were, of that epileptic disposition which before was forgot; and Aretæus^p uses the word *υπομνησις* in the same sense, as the famous Petit^q has very well remarked. Seeing therefore those ideas, the memory of which is not renewed in us for a long space of time, are gradually effaced, and as it were vanish; so there is likewise some hope, that that epileptic disposition lodged in the common sensory, by lying long quiet, and not being excited by occasional causes, may gradually be abolished, or at least so disposed as to be more difficultly roused into action by accidental causes.

§. 1081. **A**N epilepsy arising from the third cause (§. 1075, no 3.) is known from other symptoms denoting the brain likewise to be hurt; such as, pain, heaviness, fulness, a wound in the head, dizziness, universal trembling, sparks of the eyes, and an inability to move them, a circumgyration of the head, or of the whole body. The true cause of this epilepsy is hardly to be removed, because its nature is scarcely known; but revellents, discutients, preparatives, and depurators, are of service: hence bleeding, purging, vomiting, burning, issues, fistulas, epispastics, wounds of the head, trepanning, anti-hysterics, and opiates, are useful; out of which, what choice we are to make, a discovery

^p Loco ultimo citato.

^q Ibid. 277, 278.

very of the proximate cause (1079.) of the disease will teach.

The third cause of the epilepsy, as was said in the comment to §. 1075, supposes the brain hurt either in its membranes or substance : and the principal causes of those hurts were there enumerated. But the signs, which discover such a cause of the epilepsy to be present, are gathered, either from preceding hurts which have happened to the head, *viz.* from a wound, a violent contusion, preceding inflammatory diseases of the head, &c. ; or from a manifest hurt of those functions which depend upon the same state of the brain: these principal signs are mentioned in the text, and of those we treated before in the chapters of the Phrenitis, Apoplexy, Catalepsy, and Carus, which therefore need not be here repeated. If then those symptoms of the animal-functions being hurt *precede* the epilepsy, such causes may justly enough be suspected : which is chiefly taken notice of for this reason, because, in the time of the epileptic paroxysm, such force is applied to the brain, that the animal-functions remain remarkably hurt, as was said more at large in the comment to the first number of §. 1077 ; but then these hurts are the effects of the epilepsy, and not its causes. But unless those hurts happen from external and obvious causes, it does not easily appear in what part of the brain the cause of the disease is lodged, and what nature it is of. For as sharp bony spicula, arising from the dura mater, by pricking the brain, occasion an epilepsy ; so likewise an acrid ichor oozing from the carious internal table of the cranium, or the same kind of sanies collected in the ventricles of the brain, is capable of producing the same effect. Hence we are frequently much in the dark with regard to the nature of the cause of the disease, and the place where it is lodged ; and therefore the radical cure is also very difficult. But as it was observed in the comment to §. 1075, n^o 3. that all those causes which hurt the brain, may be increased by whatever determines a greater afflux of fluids towards the head ; it evi-

dently appears, that all those things are of general use, which divert the force and quantity of the humours from the head, disperse the liquids obstructed in the cranium, and relax and open the passages thro' which nature has been observed sometimes to expel them; nay, sometimes likewise new outlets have been opened by art, by which the brain might be freed from what was hurtful. But each of these, which have been observed to be of service in like cases, will be enumerated.

Bleeding.] In many epileptic persons, a plethora precedes the paroxysm: sometimes, although such a plenitude of the vessels does not obtain in the rest of the body, yet it manifestly appears that the vessels of the head are very much distended; seeing they feel a throbbing pain in the head, with an increase of heat, and the eyes are red. In such a case it is evident, that bleeding, as it lessens the fulness of the vessels, will be of service. But although the disease is not always radically cured by bleedings, yet nevertheless the paroxysms are thereby prevented. Bonetus ^a relates some cases, which inform us, that the epilepsy has sometimes been cured by bleeding. However, when the fulness lies chiefly in the vessels of the head, much good is to be expected from arteriotomy; whether the temporal artery is cut, or those arterial branches which run behind the ear. Severinus ^b asserts, that he tried this with very good success, and he relates several instances of it in the place here quoted. But we likewise see, that the ancient physicians used very bold remedies for subduing this obstinate disease, especially if its cause was thought to be lodged in the head; for then, says Aretæus ^c, it inhabits *ἐνὶ κεφαλῇ, i. e.* it has a fixed seat. If it occupies the head, he orders the veins in the arm and forehead to be opened, cupping-glasses to be applied, and all the arteries before and behind the ears to be cut; only taking care, not to let the patient bleed till he faints: for he was afraid
that

^a Sepulcret. Tom. I. lib. i. sect. 12. p. 286.

Medic. part. ii. p. 46, 47.

^b De Efficaci

^c De Curat. Morbor. Diuturnor. lib. i. cap. 4. p. 121.

that a paroxysm might thence be produced; and certainly very justly, seeing convulsions equally follow a sudden emptying of the vessels, as well as too great a fulness of them, as was remarked before from Hippocrates upon another occasion in the comment to §. 232.

Purging, vomiting.] How much good may be expected from these in curing obstinate diseases of the head, was said in the comment to §. 1026, in treating of the cure of the Apoplexy; and at the same time it was then observed, that in exhibiting vomits great caution was required, because in the time of vomiting the vessels of the head were always more turgid. Besides, it was said, that these remedies were chiefly useful, when the disease arose from a viscid, inert, cold cause. The same is likewise true in the cure of the epilepsy; for when there is heat, fulness of the vessels, or an inflammatory disposition of the blood, then greater service is expected from bleeding. In the mean time purgatives divert the force and quantity of the humours from the head, and therefore on this account are always of service. When the cause of the disease is viscid and inert, the more acrid and hot purges are used; and in this case Aretæus^d recommended his Hiera, which would draw the phlegm from the head, especially if it was given in a pretty large quantity. But when there is an inflammatory disposition in the blood, and a heat; then especially those things are of service, which act without increasing the motion or heat, and yet purge pretty briskly: such as were commended in the comment to §. 396, where we treated of the cure of Inflammation; and to n^o 2, of §. 1030, in the cure of an Apoplexy produced from the like cause.

We see likewise, that several of the ancient physicians have placed great hopes in purging remedies for the cure of this disease: the reason of which will easily appear from what Hippocrates^e has remarked. For he saw, that the epilepsy was very frequent in infants: he considered, that while in the womb they were immersed in a warm bath, and after they were born their

K k 3

flesh

d Ibid.

d In Libro de Morbo Sacro,

flesh was very soft; that all about the ears, arm-pits, and groins, was moist; the nostrils, fauces, lungs, stomach, and intestines, were besmeared with a plentiful mucus: he observed, that by age that flaccid humidity of the body was diminished, and the solid parts strengthened; and likewise that the infantile epilepsy then ceased. He remarked in those who continued weakly as they grew up, from whatever cause, that the disposition to the epilepsy continued longer with them: he observed, in dissecting the heads of epileptic sheep, a great quantity of phlegm, sometimes corrupted and fetid: he saw in adult epileptics the paroxysms to happen more frequently in winter, particularly after sudden changes of heat and cold, when the phlegmatic humours are frequently melted down; and likewise in cloudy weather, with the wind at south, especially if quickly succeeded by a cold north wind: If by any of the emunctories that viscid phlegm was evacuated in infants, as by gentle erosions of the skin of the head perpetually kept running, with a plentiful discharge of mucus from the nose, or of pituita by vomit or stool, they were the better for it; and on the contrary, if these evacuations were rashly hindered, the disease returned very violent. From all these the ancient physicians concluded, that the cure of the epilepsy consisted chiefly in evacuating that superfluous humour, and afterwards in strengthening the solids. These glutinous humours are therefore most effectually dissolved and evacuated by purgatives; while a more dry diet, bodily exercise, and abstaining from whatever is viscid, will prevent a like quantity of such humours from being accumulated afresh. But Hippocrates seems to have looked upon this as almost the only cause of the epilepsy: and therefore he has inculcated, to change that cold and inert cacochymia into its opposite, *viz.* the bilious and hot; for he imagined that persons of a bilious constitution were never epileptic.

But although this cause, mentioned by Hippocrates, frequently enough occurs; yet it appears sufficiently obvious from what has been said, that there are several other causes of the epilepsy beside. At the same time

it is evident, that purgatives are remarkably useful in the cure of the epilepsy, while its cause is lodged in the head.

Burning, issues, fistulas, epispastics.] Of how great service these are, by diverting the impulse of the blood to other parts, was said before in the cure of inflammation in the comment to §. 396, n^o 4; and therefore they are commonly used with good success in the cure of the apoplexy, as was remarked in the comment to §. 1025. For all these are used partly to divert the impulse and quantity of the humours to other parts; and partly, likewise, to evacuate by those artificial outlets whatever noxious matter might be retained, or determined towards the head. Thus in infants the skin of the head sometimes discharges a very fetid ichor; and then they are in good health: but if that discharge is imprudently checked, they become epileptic; neither can they be cured unless that discharge returns. A young girl began to be seized with the epilepsy, about the time of puberty, which has been said before to be a bad omen: being alone in the house, she was seized with a fit; and, falling into the fire, burnt her face and forehead so terribly, that not only the teguments, but the skull itself was so much scorched, that the exterior table of the cranium cast off afterwards to the size of the palm of one's hand. But as long as those parts which were burnt and suppurated discharged pus and sanies plentifully, she remained free from the disease; but relapsed, as soon as those ulcers cicatrized &c. Hence it appears, that while such a quantity of humours was discharged by these ulcers, the virus was likewise expelled, which, being retained when the ulcers were closed, renewed the epilepsy; or at least that the impulse of the humours, brought by the carotids, was so diverted to the external parts of the head, that they acted with less force upon the brain, and the disease remained quiet. Hence the reason is understood, why in curing this disease physicians have attempted to render the skin of the head as clean and perspirable as possible; and afterwards have irritated it by cupping-glasses,

glasses, depilatories, and sinapisms^g; beginning first with the most gentle, and gradually proceeding to the others, if the former produced no relief. Thus Aretæus^h ordered epispastics to be applied to the head, and especially cantharides; nay, he likewise advised burning it, in case the other applications did not answer. For Celsus has judiciously placed among the last remedies, “ Scarifying the back part of the head, and applying cupping-glasses to it: likewise burning in two places with hot iron, *viz.* the back part of the head, and below, where the uppermost vertebra is articulated with the head, that by these outlets the noxious humour may escape: By which if the disease is not cured, it will probably last for lifeⁱ.” This is indeed a severe method; but a great many patients would submit to any pain, to be cured of this terrible disease; especially as practical observations teach us, that by this method even in adults the epilepsy has been cured, which is otherwise rarely curable at that time of life. Thus Piso^k asserts, that he cured an epileptic person of forty years of age, by applying a cautery near the coronal suture: and Kemper^l says, that in Asia the same is frequently tried with very good success. Several observations may be seen in Schenckius^m which confirm this doctrine.

But as the cautery seems chiefly useful, in that, the eschar being separated, the ulcerated part continues to discharge humour for a long while; hence it is of service to keep these ulcers long open by gentle suppurants; and therefore fistulous ulcers breaking out spontaneously, issues, and setons, may produce the like effect.

A wound of the head.] For in this case a great many vessels are cut, especially if the wound is large; and therefore the like effect may be expected from thence as from arteriotomy. Besides, a wound of any consequence can hardly be cured without a suppuration; hence,

^g Vide Aretæian. de Morbis Chron. lib. i. cap. 4. p. 306 ^h Lib. i. De Curat. Morbor. Diuturnor. cap. 4. p. 121. ⁱ Lib. iii. cap. 23. p. 174. ^k De Morbis a Ceroia Colluvie, sect. 2. part. 2. cap. 7. p. 173. ^l Aanhangsel van de Histoire van Japan. p. 467. ^m Lib. i. p. 117.

hence, likewise, the effects of the preceding helps may thence be expected. But if the wound should penetrate into the cavity of the cranium, an outlet will be made for the contained noxious matter, if the epilepsy was occasioned by it. The truth of this has appeared from accidents. Thus in Marcellus Donatusⁿ we read of a French nobleman, who being troubled with the epilepsy took a journey into Italy, in order to consult the most skilful physicians there; but being plundered by robbers upon the road, and very much wounded, he was left for dead: besides other wounds, he had received a very large one in his forehead, which carried off a great part of the bone. After a long time, he was cured of this wound; and at the same time was freed of the epilepsy, which used to return upon him every month. A great many cases of the like nature are to be found in physical authors.

[Trepanning the skull.] For art imitates what chance has taught to be of service. It was remarked before, in the comment to §. 1075, n^o 3. that an epilepsy following a violent contusion of the head, was immediately relieved when by trepanning the skull an outlet was made for the pus collected under it. In an obstinate epilepsy this operation was likewise recommended by Aretæus^o. But we may expect service from it then especially, when the symptoms teach us, that extravasated humours are lodged under the skull, or when a certain part of the cranium is become carious: For unless the epilepsy is produced from such a cause, applying a trepan may indeed relieve the disease for a time, but cannot eradicate it. After applying the trepan to an epileptic person for a blow on the head, he remained free from any paroxysm, as long as the wound was open; but as soon as it was cicatrized, the disease returned^p.

[Anti-hysterics, and opiates.] These are useful, not so much by removing, or diminishing, the material cause of the disease, which hurts the brain in its membranes,

ⁿ Lib. ii. cap. 4. p. 53. Schenkiius, lib. i. p. 116.
de Curat. Morbor. Chronicor. cap. 4. p. 121.
l'Academie Royale de Chirurg. Tom. I. p. 230.

^o Lib. i.
p Memoire de

branes, surface, substance, or ventricles; but, by quieting strong passions of the mind, they compose the sudden commotions of the nervous system, which assist those permanent causes lodged in the brain, and rouse them to action, as was said before in the comment to §. 1075.

Out of which, what choice to make, &c.] These various remedies have been enumerated: but it plainly appears, that they are not suited to every case; but that they must be different according to the particular causes which hurt the brain, and therefore that those causes ought first to be carefully inquired into. Thus, for example, if a preceding violent contusion makes us suspect that extravasated humours are lodged under the cranium, or fragments of the bone prick the membranes or the substance of the brain itself, trepanning ought to take place: And in the history of Wounds of the Cranium, we mentioned those signs by which this may be known. But if we are informed by certain appearances, that a cold phlegmatic cacochymia abounds in the whole body, and lymph is gradually collected in the cavity of the brain (concerning the signs of which, see §. 1010. No II. 3.) then blisters, setons, issues, &c. will produce a good effect. If the bones of the skull are rendered carious from the venereal disease, that disorder must first be cured: And so of the rest.

§. 1082. **A**N epilepsy arising from the fourth cause (§. 1075, n° 4.) must be variously treated, according to the variety of its proximate causes: hence anodynes, paregorics, and narcotics, anti-hysterics, anthelmintics, correctors of acrimony, a seasonable incision of the gums, the removing or correcting of ulcerous matter, then become anti-epileptics.

The numerous causes of the epilepsy were reduced before to certain classes, whereby they might be the more easily discovered and understood, and so a proper re-

remedy be applied.

Those causes which were enumerated §. 1075, n^o 4. were lodged without the cranium, in other parts of the body; or being mixed with circulating humours wandered every where, and excited surprising commotions, till they were either again deposited in certain particular places, or discharged by some of the emunctories. This appeared then of the contagion of the small-pox; which often occasions epileptic convulsions, before that poison, together with the humours changed by its efficacy, is thrown out upon the surface of the body. The same is true of ulcerous matter lodged in any particular part, and resorbed into the blood. At the same time violent periodic pains, and hysteric commotions of the whole nervous system, were reckoned amongst the causes of the epilepsy; besides several other things, which load the primæ viæ by their bulk, or irritate them by their acrimony. Hence it easily appears, that against such various causes, various remedies must be required; as,

Anodynes, paregorics, narcotics.] Amongst the troublesome effects of pain mentioned in §. 226. convulsion was likewise reckoned; and it was remarked at §. 229, n^o 2. that by means of narcotic remedies, the common sensory might be rendered insensible of pain, although the cause which produced it should still remain, and thus some of the effects of it might be removed, especially those which are owing to the common sensory being disturbed by its intenseness. When therefore the epilepsy proceeds from this cause, a great deal of good may be done by quieting the pain. But what remedies are called anodyne, paregoric, and narcotic, and how they ought to be used, was before explained in the places above quoted.

Antihysterics.] These are useful, where the whole nervous system, being too delicate, is apt to be disturbed from the slightest causes, and frequently occasions surprising convulsions. Physicians have long ago observed, that there are such medicines, as by their disagreeable smell happily allay those disturbances of the nervous system. Such are assafetida, castor, gal-

galbanum, rue, &c. which discovering themselves to be very effectual in this respect, have therefore been called *antihysterical* medicines, and are often useful both externally and internally. For all these being held under the nose, and applied in the form of a plaster to the navel or soles of the feet, are frequently of great service. Trallian^a affirms, that he has cured several epileptic persons by wild-rue; which smells a great deal stronger, and is much more acrid, than that which grows in the gardens: and at the same time he adds, that he learnt this of a peasant, who by chance found out the efficacy of this remedy, *viz.* he had bruised this herb, and his whole body smelt of it, at the time that his fellow-servant fell down epileptic; when running to him, and taking him by the nose with his fingers, he immediately roused him from the paroxysm, and he remained free of it afterwards.

Anthelmintics.] Which derive this name from killing or expelling worms; of which we shall speak after in the chapter of the Diseases of Infants. It was remarked before in the comment to §. 1075, n^o 4. that that celebrated anti-epileptic of Fabius Columna, *viz.* the root of wild valerian, was of service to a great many by expelling worms out of the body.

Correctors of acrimony.] If we examine those epileptic powders which are most in vogue in the shops, we shall find, that the greatest part of them contain a considerable quantity of such medicines as absorb and correct an acid acrimony. But as that acrimony is so frequent in the bowels of children, and very often from this cause they are rendered epileptic, the reason appears why those remedies have obtained so great reputation, although they are hardly of any service in this disease when it arises from other causes. In the same manner, also, the *oleum animale* seems to act, which being freed from all empyreuma by frequent rectifications, and at the same time rendered very thin and soft, Hoffman^b and other celebrated physicians have so much commended in curing an inveterate epilepsy.

^a Lib. i. cap. 15. p. 80.
obs. xiv. p. 58.

^b Observat. Phys. Chem. lib. i.

lepsy. For by its great thinness it is rendered fit to penetrate even the smallest vessels, and at the same time by its balsamic quality it blunts and involves whatever is acrid. It seems likewise to act as a gentle anodyne, seeing it produces quiet and refreshing sleep.

A proper incision of the gums.] For thus the pain and continual irritation of the gums in children while teething, arising from that slow laceration produced by the tooth pushing out, are removed. But what cautions are here required, will be said afterwards in the chapter of the Diseases of Infants.

The removing or correcting, &c.] For unless an outlet can be made for the sanies contained in such an ulcerous part, and the ulcer cleansed, there is no hope of a cure. Practical observations confirming this are mentioned in the comment to §. 1075, n° 4. If the venereal poison infects the bones, especially of the cranium, an epilepsy frequently follows, which cannot be removed unless the venereal disease is cured: and then quicksilver, which *rashly* exhibited has frequently brought on the epilepsy (see §. 1075, n° 3), *prudently* administered becomes an anti-epileptic remedy.

§. 1083. **T**HE cure of the epilepsy arising from the fifth cause (§. 1075, n° 5.) is effected, by resolving the obstructed matter, relaxing the passages, and expelling it out of the body: hence blisters, caustics, issues, and fistulæ; medicines which promote the lochia, menses, and piles; together with diuretics; are so frequently of service in this kind of epilepsy.

In this case the cause of the epilepsy is the suppression of certain evacuations by which particular liquids, either wholesome or morbid, were sent out of the body; as was said more at large in the comment to the number quoted in the text. The cure therefore depends wholly upon these evacuations being restored. But the obstruction of the usual excretions may be

occasioned, either because the matter to be excreted is not moveable and thin enough to pass off; or because the vessels through which it is to pass are not sufficiently pervious; or lastly, because the force moving the matter through the vessels is too unactive. But it is apparent that each of these causes may exist separately, may be combined, or may concur all together. Hence likewise is understood the threefold indication of cure proposed in the text; which regards, either the matter to be excreted; the vessels by which this excretion is to be made; or, lastly, the force which moves the humours through the vessels, and applies them to the secretory or excretory organs. But according as several of these causes combine together, so several indications of cure ought likewise to concur in order to remove them.

This will perhaps be more evident from an example. It happens sometimes, that an epilepsy is produced from a suppression of the menses; the general indication then is to restore the menses. Sometimes such girls suffer from a mucous viscid cacoehymia of the blood; they are pale and bloated, the whole habit of body inclines to a leucophlegmacy, and the force of the arteries is weak; whence the matter to be excreted is not sufficiently moveable, and at the same time the moving power is deficient in strength. If therefore, by the use of chalybeates, frictions, exercise, and a drying diet, the action of the vessels upon the contained fluids is increased, the cold viscid lentor of the blood will be subdued; the complexion, which was before pale, again becomes lively; an equable heat is propagated to the extremities; and the suppressed menstrua return; *viz.* from the matter being rendered moveable, and the moving force restored.

But sometimes it happens, that the blood is good, the vis vitæ sufficiently strong; and yet the menses are suppressed, or difficultly and sparingly excreted, because the extremities of the vessels, opening into the cavity of the uterus, too much resist their dilatation. In this case, the passages ought to be relaxed by baths, steams, &c. Such girls often feel a troublesome pain about

about the os sacrum and pubis; they suffer violent griping pains, and sometimes convulsions, especially about the first eruption of the menstrea. In many this complaint is gradually cured, while the vessels, being dilated every month, begin to be more yielding; but in some, it remains for a pretty long time. That is chiefly the case where pregnancy is often serviceable: for during the time of it, all the uterine vessels are very much distended; and after the foetus is expelled, the blood flows with a considerable force as the placenta is loosened from the womb, and the lochia continue during the time of childbed; and thus the extremities of the uterine vessels are disposed to yield more easily afterwards to the menstrual discharge.

Sometimes, in very plethoric girls, the blood is good, and the vessels pervious; but so distended by too great fullness, that they cannot act upon the contained fluids; at the same time the force of the heart is suppressed, because it cannot empty itself into the vessels which are too full (see §. 106.) whence the expelling force is weakened. But as soon as the quantity of blood is diminished by bleeding, the usual force is restored to the heart and arteries, and the menstrea return even at the time the blood is flowing from the vein. At the same time it appears from what has been said, what great judgment is required in the physician, to adapt the general indications of cure to each of these cases. For to such a plethoric girl, labouring under a suppression of the menses, the use of filings of steel, frictions, and bodily exercises, would be extremely hurtful; and on the contrary, in a weak and leucophlegmatic virgin, bleeding would increase the cause by which the menses are suppressed.

It is very evident, that the like cautions are required in the method of cure, where the epilepsy has been produced from other excretions being suppressed.

But, as was said before in the comment to §. 1075, n^o 5. there sometimes happen excretions of a morbid humour by certain parts of the body, which ceasing suddenly, or being imprudently suppressed, frequent-

ly produce the greatest mischief. This is ofteneft observed in cutaneous eruptions, as was then remarked. In fuch a cafe it is beft to keep thofe parts warm, and gently ftimulate them, that the ufual difcharge of the humours by the fkin may return. Thus in infants, who have been rendered epileptic by fuddenly drying up the difcharge of ichor from the fkin of the head, it is of fervice to foment that part with a lixive of Venice foap, and afterwards cover it with an aromatic plafter. I have likewise known it very beneficial, as was obferved before, to apply over the whole fcalp a plafter of labdanum with an eighth part of bliftering plafter; for after a few hours the fkin began to grow red, a troublefome itching was produced, the flowing of the ichor was renewed, and at the fame time the epileptic fits immediately ceafed. For it is always fafeft to follicit a fuppreffed excretion by thofe parts through which it ufed formerly to pafs. But when the cutaneous veffels are fo constricted by astringents, fpirituous applications, the calxes of lead, and the like, that the ufual efflux of the ichor cannot be reftored in this place, then it is proper to try new emunctories in other parts of the body, whereby that obftructed noxious humour may be difcharged, by means of blifters, cauftics, &c. of the ufe and efficacy of which we treated before in the comment to §. 1081. In young children, it is likewise of great fervice to excite an artificial diarrhœa for feveral days, by giving manna, rhubarb, or the like mild purgatives.

§. 1084. **B**UT that epilepsy which arifes from the fixth caufe, (§. 1075, n^o 6.) muft be cured,—By ftrengthening the too great weaknefs and irritability of the nervous fyftem: which is beft done, by the exercife of walking, playing, riding on horfeback or in a chaise; by the ufe of aromatics; by chalybeats, and corroborating medicines:—By making an artificial, deep, and long-continued ulceration in the part where

where the fomes is lodged, either by incision, caustics, or blisters; and afterwards keeping it open by digestives, mixed with corrosives:—lastly, By ligatures compressing the affected nerve.

In this species of the epilepsy, that which renews the paroxysm derives its origin from another part of the body, and is perceived to ascend to the brain after the manner of a blast. Hence the method of cure is twofold: for either that part of the body whence the paroxysm was observed to have its origin, ought to be prevented from affecting the brain; or it ought to be attempted to render the brain and the whole nervous system more firm, that they may not be so easily disturbed by so slight an irritation. To this last intention especially conduces daily exercise, prudently increased, till it becomes sufficiently strong: for by this we see lax and weak bodies surprisingly strengthened; upon which consult what was said at §. 28, n^o 2. But constant observation teaches us, that persons are, *cæteris paribus*, the more obnoxious to this disease, the weaker and more lax the structure of the body is. Hence the epilepsy is so frequent in infants; who, growing stronger by age, are thereby often cured, as was said before. For the same reason, it is much more frequent in delicate girls, than in those who are forced to labour hard for their bread. Wherefore it is of the greatest service, to acquire that firm strength by bodily exercise. Hence Hippocrates, treating of this species of the epilepsy, after he has said that those especially may be cured in whom the disease takes its rise from the hands or feet, immediately adds the following: *But the physician who is acquainted with the method of cure, ought to attempt it in those patients, provided they are young and fond of labour*^a. From which passage it sufficiently appears, that Hippocrates placed great hope of curing this disease in a laborious life. Aurelianus also, describing the cure of this disease,

L 1 3 re-

^a *Cæterum horum curam aggredi oportet Medicum, qui medendi modum novit, si homines fuerint juvenes et laboris amantes. Prædict. lib. ii. cap. 7. Charter. Tom. VIII. p. 816.*

recommends “ violent exercise, whereby the strength
 “ of the body is more increased than the bulk;” *exercitia vehementiora, quæ labore corpus afficiant, affectanda, quo magis fortitudo, quam corporis robur, augeatur*^b. For by the word *robur* he understood corpulence; seeing he immediately subjoins in his ambiguous style, *Est enim semper gravabilis carnatio, et magis si tenuibus fuerit imposita viribus, et in iis passionibus quæ in nervis esse noscuntur*; “ For corpulence is always burdensome, and the more so if the person is weak,
 “ but especially in those complaints which have their
 “ seat in the nerves.” Thus also we read in Plutarch^c, that to the children of those persons who are subject to the epilepsy, melancholy, or gout, the ancients ordered a very strict diet, forbidding them strong food, high-seasoned dishes, &c. and ordered to use exercises which hardened the body, lest the small seed of a violent disease should increase. Julius Cæsar affords a great example in this respect: For, “ being of a slender habit, with a skin white and soft, an ailing head, and
 “ subject to the falling-sickness, he did not search for
 “ a pretext to indulge himself from the weakness of
 “ his constitution; but followed a military life as the
 “ remedy of weakness, and by indefatigable marches,
 “ a slender diet, and lying in the fields, resisting all
 “ sickness, he preserved his body strong against any
 “ injury^d.” For the same purpose the use of aromatics is likewise of service, as by their efficacious stimulus the action of the vessels upon the contained liquids is increased: upon which consult what was said in the comment to §. 28, in the cure of a Weak Fibre; where the virtue of steel and of corroborants is at the same time recommended for curing the too great weakness of the solids. This seems to be the reason why mistletoe of the oak has obtained such a reputation in this case, seeing it is possessed of a very strengthening quality. At the same time, also, is understood, why spaw waters, and other medicinal springs of the same kind, impregnated with particles of iron, have been so frequently

^b Morb Chronic. lib. i. cap. 4. p. 312. ^c De his, qui sero a numine præstantur, Tom. II. p. 561. ^d Idem in Vita Jul. Cæs. Tom. I. p. 715.

quently used with success in the cure of this disease: because they strengthen the too lax structure of the solids; and are of very great service both by their diluting quality, and by resorbing the obstructions of the viscera.

But sometimes that irritation of a nerve, even in a part of the body very distant from the head, is so powerful, as to disturb the whole brain of the strongest person, if the sensation of a cold air, or in others of something creeping, is felt ascending towards the head. In such a case, corroborants are of no use: But then physicians have attempted by a strong ligature, immediately applied, to hinder the ascent of that blast or creeping sensation; and thus frequently prevented the paroxysm, but not eradicated the disease. A case of this kind was mentioned in the comment to §. 1075, n^o 6. where, by a ligature tied about the leg as soon as the patient began to feel the first symptom of the approaching fit, the paroxysm was prevented. And the like effect of a ligature is mentioned by Galen^e in a boy, who felt the disease arise from his leg. But at the same time he remarks, that physicians made use of this remedy, in order to prevent the paroxysms, till, after purging the body, they could apply thapsia, or mustard, to that part which was first affected by the approaching fit. For they placed also the hopes of a cure in the erosion of that part by acrid applications; which Ægineta^f has commended: as has also Trallian^g; who observes, that no small quantity of humours are by this means drawn from the part affected, which is followed by a perfect cure.

In Asia they burn the part where the sensation is felt with moxa; whereby, when the eschar falls off, an ulcer is produced, which frequently discharges a thin ichor for a long time; perhaps a blister might have the same effect, if it was kept running: all these are of service, as they afford an easy outlet to the acrid humour here seated, or collected about the time of the paroxysm, which irritates some certain nerve or tendon, and occasions such violent effects; as was proved
upon

^e De Locis Affectis, lib. iii. cap. 11. Charter. Tom. VII. p. 445.

^f Lib. iii. cap. 13. p. 30.

^g Lib. i. cap. 15. p. 73.

upon another occasion, by several practical examples, in the comment to §. 164. But often these are not sufficient to produce a cure; and practical observations teach us, that the cure has succeeded, when the part has been cut quite into the bone, or seared sufficiently deep with a red hot iron. By both these methods every thing is destroyed in the part where the fomes of the disease was lodged; neither can the cure be then ascribed to the noxious humour being drawn out, but rather to the entire destruction of the nerve, the irritation of which renewed the paroxysm. Several such cures are related by authors: I shall only mention one at present, but it is a very remarkable one. A woman of thirty-eight years of age, had been twelve years subject to the epilepsy: In the beginning of the disease she had a paroxysm every month: afterwards it so increased, that she suffered four or five strong fits every day, each of which lasted for an hour and upwards; whence being rendered quite dull and stupid, she was no longer able to take care of her family. All kinds of remedies were used without the least success, the disease still growing worse. In the mean time the paroxysm always began from the leg, about the lower part of the gastrocnemii muscles; immediately it flew up to her head; and then she fell down violently convulsed, and foaming at the mouth. A physician, who was present during the time of the paroxysm, compared the leg affected with the other, and he could not distinguish any difference between them: however, he boldly thrust in a scalpel to the depth of about two inches; and in the bottom of the wound he found a hard cartilaginous body, somewhat larger than a pea: he separated it from the muscles, and found that it rested upon a nerve; cutting the nerve, he laid hold of that heterogeneous body, and pulled it out: this was no sooner done, but immediately the patient recovered out of the fit, saying, that she was very well; and afterwards lived quite free of this terrible disease, and recovered her former vigour both of mind and body^h.

How surprising must it appear to every person, that
such

such a hard little body, by its bulk only irritating the nerve to which it adhered, in a part so distant from the head, should occasion a paroxysm so often every day? What little hope did there seem to be of a perfect cure, when she was rendered so stupid? which shewed the brain to be very much affected with so many violent concussions, see §. 1077. However, the lucky boldness of a skilful physician in the space of a few minutes eradicated this disease; and even without any pain to the patient, seeing epileptic persons are void of feeling during the time of the paroxysm.

Having related every thing that has been found certainly to be of service in the cure of this disease, we come next to examine what is to be done in the time of the paroxysm. In the first place, we must take care, by means of pillows or other contrivances, to prevent the head or other parts from hitting against any hard bodies that may be near: a bit of cork, or soft wood, must be put between the anterior grinders, to hinder the patient from biting his tongue; but there ought to be a thread fastened to it, to pull it out by, because there is danger of its falling down into the throat. The convulsed limbs are to be gently extended; using little or no force, because then it would be hurtful. I have often been provoked at seeing very strong men attempt with their whole force to extend the thumb in delicate girls, whence there remained afterwards very troublesome pains, from the ligaments and muscles being violently strained. Wherefore Aretæusⁱ prudently advises the convulsed parts to be softly stroaked with hands rubbed with oil, and the limbs gently held lest they should be distorted in the time of the paroxysm. It is a custom likewise with many, to hold acrid substances under the nostrils of epileptic persons, which irritate the nervous membrane lining them, and frequently produce a troublesome and dangerous sneezing, while in the time of the fit the whole face becomes turgid and livid, the eyes swelled and bloodshot, evidently shewing that the veins and arteries of the brain are too much distended with

with accumulated blood; and therefore that strong concussion, which is occasioned in the time of sneezing, might endanger a rupture of the vessels. Hence Aurelianus has justly condemned sternutatories, and acrid fumigations of very fetid remedies, because even persons in health find their heads loaded and rendered giddy by the means of them; “Fumigation affects the swelled eyes in the same manner as it does the tumid membranes of the brain ^k.” Celsus ¹ condemns the same remedies, as of no manner of service.

But when the epileptic patients recover from the fit, they are very weak, dull, and stupid; and then it is proper to give them such remedies as raise the torpid spirits; such are, all the aromatic distilled waters of the shops, viz. of rosemary, rue, lavender, and the like; adding to these tincture of amber, spirit of sal armoniac, or other stimulating medicines of the same kind; the use of which must be persisted in a day or two, till the wonted alacrity and vivacity return: for then, these being laid aside, we must proceed to other remedies, according to the different methods of cure above mentioned.

Aurelian also very well advises those who are cured of this disease, to beware for a long time of committing any error in the six non-naturals, to avoid turning round, looking down from a precipice, &c. “For as recent cicatrices of ulcers easily break open again; in like manner this complaint, or any morbid habit of the same nature, returns upon the slightest occasion, after it appeared to be entirely cured ^m.”

§. 1085. **H**ENCE appears the vanity of all specifics, and methods of cure, which empty boasters extol against this disease.

The causes of the epilepsy were first related, and for order's sake reduced into several classes; after which was described the method of cure proper to each of these classes. For it appears at first sight, from what has been said, that very different remedies, and a different

^k Morbor. Chronic. lib. i. cap. 4. p. 316.
p. 172.

^m Loco citato, p. 313.

¹ Lib. iii. cap. 23.

ferent method of cure, are frequently here required, according to the variety of the causes of the disease, and of the parts in which those causes are lodged. Whence at the same time it appears, that an universal specific remedy, capable of subduing all and each of these causes, can hardly be expected.

Yet there are a great many specifics boasted of in this disease; and indeed such is the number of them, that to collect them all from the different authors would be both tedious and irksome, and not very useful, seeing their effects by no means answer to the promises which are made from them. In the meantime, those who so much extol the force of specific remedies in curing this disease, make use of a specious argument in favour of them. For it appears from the whole history of this disease, that epileptic persons do not always suffer a paroxysm; but they are frequently free from it for a considerable time, till by the various occasional causes above mentioned the fit returns afresh. It appears likewise, that these occasional causes only excite a paroxysm in those persons in whom the predisponent cause of the disease is lodged; for it does not arise in other persons from the same causes. They easily grant, that these different occasional causes cannot be removed by one and the same remedy: but they believe, that the predisponent cause, which is perhaps much more simple, (and they will have it to be one and the same in all epileptic persons), may be cured by some certain specific remedy; or at least so weakened, as not to be excited into action by the occasional causes. To demonstrate the possibility of this, they instance the specific virtue of the Peruvian bark, and of opium, whereby the former cures intermitting fevers, and the latter removes the sense of pain although the cause of it still remains. The chemists here boast of sacred remedies, by which they say they can cure the epileptic disposition, and prevent the commotions of the raging Archæus, or immediately suppress them. What good is to be expected from these, was said upon another occasion in the comment to §. 1080. But can any one really believe, that bony
spicula

spicula irritating the brain itself or its membranes, bony excrescences of the cranium, or a cartilaginous hardness of the venous sinuses, all which were proved to constitute the predisponent cause of the epilepsy, can never be removed by the most celebrated arcana? Can the fluxile softness, and the easy irritability, of the brain and the whole nervous system, which predispose infants to the epilepsy in such a manner as that they are immediately convulsed upon the slightest occasional causes, be cured by any kind of remedies? In this case a cure may justly be expected from the strength of the body being increased by age and wholesome exercise; and in the mean time skilful physicians take care to prevent, or remove, all the occasional causes, which by vellicating the stomach and intestines, or irritating the gums at the time of teething, might produce an epileptic paroxysm. If any one considers all these, he will easily see, that those who promise an universal anti-epileptic remedy, are either imposed upon themselves, or impose upon others.

But as the epilepsy is frequently attended with such terrible and various symptoms (see §. 1072,) that it is ascribed by many to supernatural causes; hence also surprising remedies, some of them nasty enough, and a great many others superstitious, have been boasted of for curing this disease, a great number of which may be had in various authors. “Some have cured
“ themselves of this disease, by drinking the warm
“ blood of a gladiator that had just been killed, in
“ which persons a shocking remedy has been rendered tolerable by a more shocking disease ^a.” Aretæus ^b attests, that he saw the same remedy made use of; but at the same time he adds, that nobody could affirm to him that the patients were thereby recovered. Tulpius ^c tells of a young man in the flower of his age, and a grown-up virgin, labouring under this disease, who the same day drank the blood of a youth that was killed; but the disease was rather increased than diminished by this abominable remedy. Perhaps
some

^a Cels. lib. iii. cap. 23. p. 174.
cap. 4. p. 122.

^b Morbor. Diuturnor. lib. i.
^c Observ. Medic. lib. iv. cap. 4.

some may imagine, that the horror of so unnatural a remedy might occasion a sudden and remarkable change in the epileptic patient, and so produce an alteration in the present state of the body, whence there might arise some hope of a cure: but the young man mentioned by Tulpius, with his hand trembling, his eyes turned from the blood, his face pale, and his whole body shuddering, threw the blood hastily and with reluctance into his throat, all which shewed that he was not a little shocked; and yet that terrible disease, instead of being thereby cured, was rendered a great deal worse. Some have ordered a human liver to be eat, the marrow of the bones of the legs, the brains of infants, and the powder of the skull of a person who had died a violent death^d. We see, not without indignation, these nasty remedies mixed with the anti-epileptic formulæ of the public dispensatories. And we may say with Pliny, “Who has invented those prodigies? Thou wilt be called to an account for it, thou overturner of human order, and fabricator of things monstrous and unnatural, &c. Who has ordered all the human limbs to be eat? Upon what notion could this be founded? What could give origin to that physical prescription? Who has rendered poisons more innocent than medicines, &c. ? Let these things be banished far from hence; we speak of remedies, not atonement for crimes^e.”

There are a great many other things boasted of, as is very well known; which indeed are less disagreeable, but perhaps equally useless. Elk’s hoof, *v. g.* which is a celebrated ingredient in all epileptic powders, is believed to be of service, because that animal is frequently seized with that disease. But if it was true what the ancients said of the elk, that it was rarely to be met with, seeing, as it has a very acute smell, it was sensible of the human scent at a considerable distance, and immediately ran to hide itself in the thick forest; neither was it safe to come near this fierce animal, as it was so strong, that by kicking with the hind-feet it was able to break even trees themselves, and

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^d Aretæus, loco citato.^e Plin. Hist. Nat. lib. xxviii. cap. i. p. 683.

with the fore-feet would kill the hunter who came up with him ^f; it does not seem credible after this, that the elk could be frequently seen by men, while it was seized with a fit of the epilepsy. Perhaps they might see this animal convulsed after it was wounded: but hunters very well know, that this frequently happens to stags, boars, and other wild beasts; and bullocks that are killed usually suffer violent convulsions before they die, the vessels being emptied by the copious and sudden effusion of blood. Hence it is by no means certain, that they are subject to the epileptic disease; and supposing it was true, if eight whole hoofs (for it has two on each foot) cannot preserve that animal from the epilepsy, can such an effect be reasonably expected in us from the powder of the hoof given to the quantity of a few grains?

Farther, we read in Olaus Magnus ^g, that the elk, when he falls down epileptic, thrusts the outward hoof of the right foot into his ear, and immediately after recovers of the paroxysm. But authors have remarked, and the anatomists have confirmed this, that the joints of the elk's legs are very stiff; and hence it is scarce possible, that they can be so bent as that the outward hoof of the right foot can be made to touch the ear. If to these now are added the difficult circumstances related by some authors, and yet quite requisite, for the elk's hoof to produce such a surprising effect in the human body, the number of obstacles will still be increased. They allege, that the elk's hoof has only that efficacy if it is cut off by the blow of a hatchet while the animal is yet alive, and only on a certain day in the year. Besides, it ought to be a male, strongly rutting, and yet never having copulated. Does it seem very likely, that the elks hoofs which are sold in the apothecaries shops have all those conditions? Nay, it is hardly credible, that the great number of those hoofs, which are dispersed thro' the shops over all Europe, can have been taken from this animal, which is so unfrequently to be met with.

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^f Ouvrages adoptes par l'Academie des Sciences, Tom. I. p. 171, &c.
^g Vide locum citatum.

It would be sufficient, I believe, to have given the origin and history of those specifics, to make the uselessness of them, and of others of the same kind, evidently appear: for the same might easily be demonstrated of others. But cunning quacks, who boast of their secrets, always add so many requisite conditions, both in diet and in other things, that it is impossible for the patients, let them take ever so much care, not to transgress frequently against the rules prescribed. Nor is this a new circumstance; for Hippocrates long ago complained of those impositions. In his time they prohibited bathing, and several kinds of food: besides, “ They forbade them to wear black, for black was a
 “ fatal colour; nor to lie upon a goat-skin, nor even
 “ to wear it; nor to place either one hand, or one
 “ foot, upon the other: for all these were obstacles
 “ to the cure ^h.” If the disease lay quiet spontaneously for any considerable time, as frequently happens, or was rendered better by age, the cure was attributed to those specifics: but if the disease remained, or perhaps grew worse, they always had something in readiness to blame, that the failing of the cure might be ascribed to the negligence of the patient, and not to the uselessness of the specific remedy.

But as most part of these specific anti-epileptics do not disturb the body much, and the opinion conceived of those remedies cannot be easily blotted out of the minds of some persons, even your skilful physicians have readily enough consented to the use of them, especially while they are observing attentively the course of the disease, and the causes which renew the paroxysm (see §. 1080,) and do not chuse to attempt any thing before they are certain what they ought to do and by what remedies. Then those specific anti-epileptics which are innocent take place, that they may satisfy the patient and his friends in the mean time, while the physician collects the history of the disease: For they would all imagine the patient to be neglected by the physician, if he was to give them no remedy in so violent a complaint.

§. 1086. **A**ND it appears also, that the immediate cause of every true epilepsy is always too great an action of the brain upon the nerves of motion, and none upon those of sensation.

It is demonstrated in physiology ^a, that the first origin of all the senses and motions is lodged in the encephalon; but in what parts, has not yet been shewn. However, practical observations teach, that the origin of the senses is distinct in us from that of the motions. Thus in the history of the palsy it appeared, that sometimes the motion in a certain part of the body was abolished, while sensation remained unhurt; and that on the contrary, sometimes all the sensation was lost in the part, while the motion remained. Wherefore either of these may be affected, the other continuing perfect; and hence they ought to be differently seated in the common sensory: for it cannot be conceived, if the first origin of the motions and senses had a seat absolutely in the same place, how the morbid cause should only act upon one without affecting the other. But in the perfect epilepsy, as was said in the comment to §. 1071, all the senses both internal and external are abolished; and therefore, in the time of the paroxysm, the brain exercises no action upon the nerves of feeling: but the motions are stronger, and indeed much more violent, than they could be exerted by the same person in health; and therefore the action of the brain upon the nerves of motion is too great. But, towards the end of the paroxysm, even the origin of the motions is likewise affected; for then the convulsions usually cease, and there follows a profound sleep with snoring, as is common in apoplectic persons; and when they are carried off in the epileptic fit, they almost always die apoplectic, as was said before.

It is observed sometimes in persons, who are otherwise in health, that all the senses are lulled asleep, while the muscular motion of the body still remains; which again teaches us, that the origins of the senses

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^a Vide Boerhaave Institut. Med. §. 284.

and motions in the common sensory are so disposed, that one of them may cease entirely from action, while the other continues to act. In natural sleep, the senses and motions are all at rest; but in persons who walk in their sleep, the senses only are quiet, while the motions still go on. Galen^b owns he could not believe, that it was possible for persons to walk in their sleep: but, being taught by his own experience, he acknowledged the truth of it: for travelling all night, he walked almost a whole furlong asleep, and dreaming; till, hitting against a stone, he was thereby awakened. In physical authors, there are numerous examples of persons who walk in their sleep; and some of them inform us, that men asleep have gone up and down stairs, and done a great many things which they used to do in the day-time, as is very well known. But sometimes also in persons awake we see the senses so lulled, that they hardly either see or hear, while in the mean time their bodies are still in motion. I have known this happen to several men of learning, who being plunged in deep meditation while they were walking, have neither saluted their friends whom they met, nor heard the noise of coaches or horses, have run against obstacles in their way as if they were blind, have passed the place which they intended to go to when they went out, or perhaps quite wandered out of their road; and thus, after walking an hour or two, awaking as it were out of a sleep, they knew not where they were, the strong attention of their mind had so deadened the other senses. Perhaps some may be inclined to believe, that the action of the senses remains still in such persons, although not so active. But those whom I have happened to see, who walked in their sleep, had their eyes open, and the pupil very much dilated, as is usual in the gutta serena; neither did it contract when the candle was held near it, nor the eye-lids move: but when by laying fast hold of them they were awakened, they immediately shut their eyes, and perceived an uneasiness from the light being too near.

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^b De Motu Musculorum, lib. ii. cap. 4. Charter. Tom. V. p. 387.

But there is another surprising case which informs us, that all the senses may be perfectly asleep, while the motion of the body and speech still remain. A virgin of twenty years old had suffered a true and perfect catalepsy for some months; after which it put on another appearance, and returned almost every day. The paroxysm began thus: She was first seized with the catalepsy: after five or six minutes, she began to yawn; raised herself up; then spoke with great vivacity, and with more sense and spirit than she used to do when the fit was off: she seemed to direct her discourse to several persons who were about the bed, reproved them very sharply under counterfeit names, accompanying her discourse with proper gestures and motions of the eyes; and yet all the while she was quite destitute of all sensation: afterwards she began to sing and laugh, jumped out of bed, walked about the ward of the hospital, avoided every obstacle, went back again to her bed, covered herself with the bed-clothes, and soon after was seized again with the catalepsy: in a quarter of an hour after, she awaked as if out of a profound sleep, quite unmindful of every thing that happened during the time of the paroxysm^c. A very skilful physician at Montpelier, Sauvages de la croix, examined all the organs of the senses in the time of the fit, but could not find any sign of sensation remaining: for neither a sudden loud sound, nor the flame of a candle held so near her eye as to burn the hairs upon the eye-lids, could so much as make her wink, but she proceeded in the same discourse which she begun. Neither could the spirit of wine dropt into her eyes or poured into her mouth, nor spirit of sal-armoniac nor snuff blown up the nostrils, nor pricking with needles, make her discover the slightest sense of feeling. Wherefore it appears from what has hitherto been said, what various and surprising diseases may arise in the body when the origin of the senses and motions is hindered or disturbed. In the apoplexy, there is an abolition of all the senses and voluntary motions, with a profound sleep, and snoring;

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in the catalepsy the motions and senses are suppressed, but without that sleep and snoring, and the body retains the same state which it was in the moment that the disease came on. In persons who walk in their sleep, the senses are all laid quiet, but the motions are performed like those which are observed in people who are awake. In the epilepsy, both the internal and external senses cease; but violent convulsive and involuntary motions are produced, quite different and stronger than those which are performed when the paroxysm is off.

§. 1087. **A**ND that the causes, which produce the reciprocal paroxysms, are very numerous and various.

This appears from enumerating the causes, both proegumenous or predisponent, and procatactic or exciting; all which were related in the comment to §. 1075.

§. 1088. **L**ASTLY, the origin, nature, effects, and cure, of a spasm of a particular part, of the opisthotonus, emprosthotonus, and universal tetanus, easily appear; seeing these are only different kinds of epileptic fits.

The definition of a perfect epilepsy was given at §. 1071, *viz.* that it was an abolition of all the senses, with a violent and involuntary concussion of all the muscles, or of some of them. Hence particular spasms of certain muscles sometimes accompany an epileptic paroxysm, as daily observations teach us; and yet the disease is called the epilepsy, and not a spasm. We are sometimes shocked, by seeing epileptic persons, in the time of the paroxysms, become stiff all over the body with a tetanus: soon after, the tetanus remits; and the muscles bending the head, neck, thorax, and loins, forward, are seized with a violent spasm, and thus produce an emprosthotonus: sometimes those which bend the head, neck, and back, backwards, be-
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ing affected the same ways, produce an opisthotonus; than which nothing has a more terrible aspect, while the whole trunk of the body is bent back in such a manner, as that the hind-head almost touches the hips, the whole face becoming turgid and livid, and the eyes prominent and blood-shot.

But sometimes a spasm, tetanus, &c. happen, although the external and internal senses remain unhurt; and then these complaints do not fall under the definition of a perfect epilepsy. If we look into Aretæus^e, who has described those terrible distempers so well, he says that the pains are very violent, and the voice whining; whence he justly concludes, that they are not always deprived of their senses when they are attacked with those complaints. The young girl who was seized with the tetanus, the history of which I gave in the comment to §. 712, constantly retained all her senses. Wherefore in these diseases there is indeed too great an action in the brain upon the nerves of motion, but at the same time the action of the senses remains, which in the perfect epilepsy is abolished, as was said at large in the comment to §. 1086. Thus likewise it is frequently observed, that hysteric women are seized with strong convulsions, although the actions of all the senses remain entire.

But if we consider what was said of the origin and nature of the epilepsy at §. 1074, as also what was observed concerning the effects of it at §. 1077. it will evidently appear; that all these may be applied to spasms of particular parts, as to the opisthotonus, emprosthotonus, and tetanus: and it will likewise appear, that the same method of cure is then required; as they only differ from the epilepsy in this, that the actions of the senses remain unhurt, or at least not entirely abolished.

De Causis et Signis Morb. Acut. lib. i. cap. 6. p. 3, 4.

Of the TENTH VOLUME.



